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March 30, 2001

Mr. Nolan Bennett  
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Sent via e-mail: [nbennett@bernco.gov](mailto:nbennett@bernco.gov) and US Mail

RE: Transmittal of Hydrogeologic Investigation Report  
2700 Isleta Blvd. SW, The Climate Roofing Site; NMED/USTB Facility ID No. 3245001  
Contract Control No. 980473

Dear Nolan:

Please find included herewith one copy of the Hydrogeologic Investigation Report for the Climate Roofing site. Recommendations for further action include the preparation of a Tier 2 evaluation to determine if any additional remedial efforts are necessary at the site, continued quarterly ground water monitoring and the resolution of remedial action options regarding right-of-way upgrades for the Isleta corridor. The 2<sup>nd</sup> Quarterly Ground Water Monitoring Report for this Site is due on 7/15/01.

Please do not hesitate to contact the undersigned if you have any questions or comments regarding this matter.

Respectfully submitted,  
FAITH ENGINEERING, INC.

Stuart E. Faith, PE, CS #80  
President

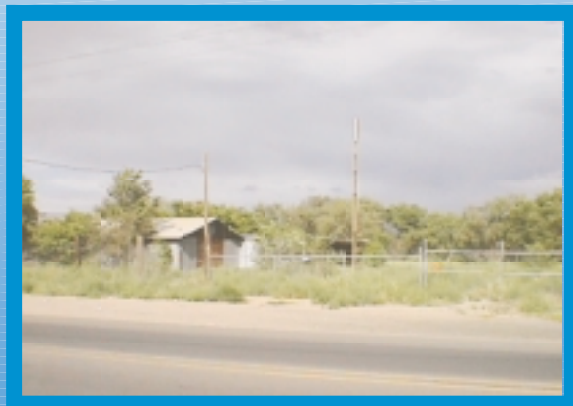
cc. w/ encls. Mr. Tom Leck – NMED/USTB  
Mr. Bill Brown - TPA

# Hydrogeologic Investigation

**Climate Roofing Site  
2700 ISLETA BLVD.,  
SW**

**ALBUQUERQUE,  
BERNALILLO  
COUNTY, NM**

**March 30, 2001**



**Prepared For:**

**Bernalillo County Environmental  
Health Department  
600 Second St. NW, Suite 500  
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**Prepared By:**

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**HYDROGEOLOGIC  
INVESTIGATION  
REPORT**

**CLIMATE ROOFING  
SITE**

**2700 ISLETA BLVD.,SW  
ALBUQUERQUE, NEW MEXICO**

**FAITH ENGINEERING, INC.**

**TECUMSEH PROFESSIONAL  
ASSOCIATES, INC.**

**MARCH 30, 2001**

Submitted to:

Mr. Nolan Bennett  
Environmental Health Scientist  
Bernalillo County Environmental  
Health Department

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## ***1.0 EXECUTIVE SUMMARY***

On behalf of the Bernalillo County Environmental Health Department (BCEHD), Faith Engineering, Inc. (FEI) and Tecumseh Professional Associates, Inc. (TPA) performed a Hydrogeologic Investigation (HI) at the Climate Roofing Site (the Site) located at 2700 Isleta Blvd., SW in Albuquerque, New Mexico (Figure 1). The HI was performed to evaluate hydrocarbon releases discovered during removal of former underground storage tanks (USTs) at the facility in 1990 (Figure 2). The Site is located approximately half a mile north of the intersection of Highway 500 (Rio Bravo Blvd.) and Highway 314 (Isleta Blvd.). Land use in the immediate area is a mixture of light commercial and residential (Figure 2).

The Site was first investigated by FEI in October, 1990 under contract with the New Mexico Environmental Department, Underground Storage Tank Bureau (NMED/USTB) through a cooperative agreement with the Albuquerque Environmental Health Department (AEHD). Investigation activities at the Site included advancement of 20 soil borings from which 13 monitor wells were completed in October 1990. In 1992, FEI conducted a short-term air sparging/vacuum extraction (AS/VE) pilot test and installed a full-scale AS/VE remediation system. The AS/VE system was operated between January 1993 and June 1996. During this period of operation it is estimated that 4200 lbs. (700 gal.) of hydrocarbons were recovered via physical extraction. An unknown amount was also removed via enhanced biodegradation.

During installation and operation of the AS/VE system by FEI, an abandoned home/office building (noted as demolished on the site maps) prevented active remediation in the area immediately downgradient of the UST source area. This precluded removal of a significant portion of the residual contamination. This building was demolished by the current site owner after the previously operated AS/VE system was shut down in June 1996.

The objective of FEI/TPA's HI was to better characterize the current subsurface hydrogeologic regime and the vertical and horizontal extent of soil and groundwater impacts at the Site following remedial efforts. The HI included four primary tasks: 1) review of FEI and NMED/USTB files, site mapping and photography, and review of historic soil and ground water data, 2) re-sampling and analysis of ground water from previously installed monitor wells, 3) advancement and sampling of new soil borings and monitor wells, and 4) completion of this summary HI Report.

Initial FEI/TPA ground water sampling took place on September 12, 2000. TPA drilling activities took place at the Site between October 31, 2000 and January 29, 2001. A total of 17 boreholes were advanced in the Site vicinity. Four were completed as monitor wells (Figure 2) and the remainder were plugged and abandoned. Final ground water sampling took place on January 30, 2001.

Retrieved samples collected from boreholes indicate soils between the ground surface and approximately 17 feet below surface grade (bsg) can be subdivided into 2 primary laterally extensive Lithologic Units (Figures 3 and 4). Lithologic Unit I extends from the ground surface to approximately 5-7 feet bsg and is comprised primarily of fine to medium grained silty sands, very fine to fine grained silty clayey sands, and lesser amounts of sandy silty clays and clays. Horizontal facies changes in this unit are common. Lithologic Unit II extends from the base of Lithologic Unit I to approximately 17+ feet bsg and is composed primarily of poorly sorted sands ranging in size from fine to coarse with lesser amounts of fine to coarse gravel with some cobbles. The overall trend at the Site is a gradual coarsening downwards.

During the Investigation, ground water saturated conditions were encountered at a depth of approximately 8-9 feet below surface grade (bsg). Evaluation of ground water level measurements indicates the potentiometric surface sloped to the southwest at a gradient of approximately 0.0007 feet/foot on January 30, 2001 (Figure 5).

Gasoline hydrocarbon impacts to soils in the immediate vicinity of the Site were found in an area extending west-southwest from the vicinity of the former UST piping and dispensing system to beneath Isleta Blvd. (Figures 4, 6, and 7). Total petroleum hydrocarbon (TPH)<sub>gasoline range</sub> levels in retrieved soil samples were measured at concentrations of up to 2,600 parts per million (ppm) and total ionizable volatile compounds (TIVC) headspace concentrations exceeded 10,000 parts per million/volume (ppm/v). TPH<sub>diesel range</sub> concentrations were identified at levels up to 1,618 ppm in retrieved soil samples and appeared limited to an area in the vicinity of wells FTW-13, FTW-14, and soil borings B-1 and B-6. Based on analysis of laboratory chromatograms and knowledge of past site use, these heavier hydrocarbon compounds are likely kerosene.

Ground water impacts at the Site are characterized by dissolved-phase total xylenes, extending off-site to the west-southwest (Figure 8). Ground water sample data from monitor wells FTW-15 and FTW-16 indicate that total xylenes are above New Mexico Water Quality Control Commission (NMWCC) and New Mexico Environment Department, Underground Storage Tank Bureau Standards (NMED/USTB) at 787 ppb and 1500 ppb respectively. The majority of lighter

end BTEX and TPH compounds appear to have been removed from the Site by the in-situ AS/VE system and natural biodegradation and dispersion processes.

Inorganic ground water quality is somewhat variable across the Site, but is generally dominated by the presence of low to moderate levels of reduced iron, bicarbonate, and sulfate, and very low to non-detect levels of nitrates.

An estimated 2,300 cubic yards of hydrocarbon contaminated soil is present in the Site vicinity. However, residual TPH spill mass estimates suggest that only approximately 200 gallons of TPH is still present in the immediate Site vicinity. *Pre- and post-remedial TPH soil estimates suggest nearly 80% of prior TPH contamination has been removed from the Site.*

The vertical and horizontal extent of soil and ground water hydrocarbons exceeding WQCC standards has been defined with the exception of contaminants present beneath State Highway 314 (Isleta Blvd., SW). Based on existing data, the ground water plume at the Site is in "hydrodynamic equilibrium" or is decreasing in size. FEI/TPA recommends a Tier Two risk assessment be performed at the Site and continued quarterly ground water monitoring be implemented to document plume migration patterns.

Additionally, prior to initiating remedial action design at this site (and others under this contract), FEI and TPA recommend that a decision be reached between state and county agencies regarding cleanup of soil and ground water within the Isleta Blvd. right-of-way (ROW). The option of removing contaminated soil immediately before new roadway construction has been recommended for this and other similar sites on Isleta Blvd., but has not received unanimous support. Cleaning up contaminants in the ROW and adjacent properties prior to roadway/utility upgrades by in-situ methods may not achieve sufficient cleanup to provide construction worker protection during conventional roadway/utility construction activities.

## **2.0 INTRODUCTION**

### **2.1 BACKGROUND/SITE HISTORY**

The Climate Roofing Site is located at 2700 Isleta Blvd., SW (the east side of US Highway 314) in Albuquerque, New Mexico, and is highlighted in the site basemap shown in Figure 2. Surrounding properties include a Sonic drive-in and a small strip mall containing a variety of small businesses across US Highway 314 to the west and residential housing to the north, south and east.

Hydrocarbon releases were first identified at the Site in 1990 when an underground storage tank (UST) was removed under the direction of the Albuquerque Environmental Health Department. Based on limited laboratory analysis of soil samples, it appeared that both gasoline and diesel fuels were released at the Site.

Between October 1990 and July 1992, Faith Engineering, Inc. (FEI) conducted a site investigation which included advancement of twenty soil borings of which 13 were completed as monitor wells. In addition, pilot testing was performed to assist in design of an Air Sparge/Vacuum Extraction (AS/VE) remedial system. Installation of the AS/VE system took place in December 1992, and the system was turned on in January 1993.

The AS/VE system was operated until June 1996 during which time approximately 4200 lbs. (700 gal.) of hydrocarbon were removed and an unknown amount was also removed by enhanced in-situ biodegradation.

### **2.2 SCOPE OF WORK**

FEI/TPA's initial scope of work for the project consisted of four primary tasks:

- ❑ Review FEI and NMED/USTB files, site mapping, photography, and review of historic groundwater and soil data.
- ❑ Assess current Site conditions, sample existing monitor wells and conduct three additional quarters of sampling.
- ❑ Advance and sample soil borings and monitor wells in the Site vicinity to identify the magnitude and extent of soil and groundwater hydrocarbon impacts and better evaluate site hydrogeology.

- Analyze collected data and prepare and submit a Hydrogeologic Investigation (HI) Report pursuant to the USTR Part XII, Section 1212.

This HI report was submitted on behalf of Bernalillo County Environmental Health Department to the NMED project manager, Ms. Lane Andress on March 30, 2001.

### **3.0 PHYSICAL SETTING**

#### **3.1 PHYSIOGRAPHY**

The Climate Roofing property is approximately 1.1 acres in size, and is located at an average elevation of approximately 4,928 feet above mean sea level. Regional topography slopes toward the Rio Grande, which is located approximately 2,000 feet to the east of the Site (Figure 1). Locally, runoff from the Site drains to the south.

#### **3.2 GEOLOGIC SETTING**

##### **3.2.1 Regional Geology**

The Site rests on Quaternary fluvial sediments deposited by the nearby Rio Grande. Underlying the Site are poorly to moderately consolidated sedimentary rocks of the Tertiary Santa Fe Group (Kelly, 1977). During this investigation, only the uppermost Quaternary fluvial unit was encountered.

##### **3.2.2 Site Geology**

During this Investigation, a total of 17 soil borings were advanced in the Site vicinity to depths of between 11-17 feet bsg at the locations shown in Figure 2. Four of these borings were completed as monitor wells. Hollow-stem auger (HSA) drilling techniques were used to advance and sample each borehole. Site geology as observed in retrieved split-spoon samples and soil cuttings can be subdivided into two primary lithologic units based on grain size and areal extent. Although facies changes were observed during drilling activities, each of these primary stratigraphic units was found to be laterally persistent across the Site. To better illustrate site geology, TPA constructed the simplified geologic cross section shown in Figure 3 for the locations A-A', B-B' and C-C'. Borehole lithologic logs are presented in Appendix A.

Lithologic Unit I extends from the ground surface to approximately 5-6 feet bsg and is comprised primarily of fine to medium silty sands and clayey silty sands with lesser amounts of clayey sands and clays. Sediments containing clay in this interval often exhibit low to moderate plasticity. A prominent approximately 2-foot thick carbonate-cemented, silt-rich interval is present across the Site from approximately 3-5 feet depth. Lithologic Unit I is typically finer grained and less permeable in nature than underlying sediments.

The contact between Lithologic Unit I and II is generally gradational in nature over a 1 to 2-foot

interval. Lithologic Unit II extends from the base of Lithologic Unit I to approximately 17+ feet bsg (deepest borehole advanced at the Site). This Unit is composed primarily of fine to coarse sands with lesser amounts of gravels. Lithologic Unit II is typically gradational in nature, coarsening downwards.

Horizontal facies changes are common in both Lithologic Units I and II. Soils encountered during the HI drilling appeared to have been deposited by fluvial processes associated with the nearby Rio Grande and represent a combination of axial channel deposits and over-bank deposits. In the Site vicinity, all borings advanced encountered sediments coarsening downwards with the exception of B-15.

### **3.4 HYDROGEOLOGIC SETTING**

Ground water was encountered in the Site vicinity at a depth of approximately 7-8 feet. Ground water is typically encountered slightly below or at the contact between Lithologic Units I and II (Figure 3) and is unconfined in nature. Based on early groundwater sampling efforts at the Site, the aquifer is of high yield. Newly installed FEI/TPA wells recharged quickly during sampling. The new wells were screened across the water table using standard well construction techniques.

Ground water level measurements in Site vicinity monitor wells are summarized in Table 1. Analysis of ground water level data collected on September 12, 2000 and January 30, 2001 suggests the ground water potentiometric surface slopes to the west-southwest at a gradient of approximately 0.0007 feet/foot (Figure 5).



## **4.0 FIELD AND LABORATORY SAMPLING METHODS AND PROCEDURES**

### **4.1 GENERAL**

This section describes the methods and procedures for the following project activities:

- ❑ Soil Boring and Monitor Well Installation
- ❑ Subsurface Soil Sampling and Analysis
- ❑ Groundwater Sampling and Analysis

As per the requirements of CFR 1910.120, FEI/TPA prepared a site specific Health and Safety Plan prior to initiation of field activities at the Site. A copy of the Health and Safety Plan is presented in Appendix C.

### **4.2 SOIL BORING AND MONITOR WELL INSTALLATION**

Seventeen soil borings were advanced in the Site vicinity between October 16, 2000 and January 29, 2001 using a CME-75 hollow-stem auger (HSA) drill rig supplied and operated by Rodgers Drilling, Inc. or by a small truck-mounted low-mast rig operated by NEVEX, Inc. Following advancement, all soil borings not completed as monitor wells were abandoned by backfilling with approximately 3-5 feet of activated bentonite pellets, bentonite-cement grout and approximately 1 foot of native fill at the land surface. Borehole lithologic logs and monitor well completion diagrams are located in Appendix A. Four of the seventeen boreholes were completed as 2-inch diameter PVC monitor wells. Each well was completed with 10 feet of schedule 40, 0.01 slot standard high flow PVC well screen. A 10-20 silica sandpack was emplaced from the base of the borehole to approximately one to two feet above the top of the well screen followed by approximately 2-4 feet of bentonite pellets. Bentonite was hydrated in approximately one-foot lifts by adding water. A bentonite-cement grout was emplaced from the top of the seal to just below the land surface followed by a standard 8-inch man-way and concrete apron. A compression plug with lock was inserted in the top of each PVC well casing.

Sediment samples were collected from each borehole on a continuous basis using three-inch diameter, 5-foot long split-spoon core barrels or 2-foot long drive split spoons. Samplers were decontaminated between sample runs using an alconox solution followed by a tap water rinse. All soil samples were described by a TPA Geologist or Engineer using the Unified Soil Classification System (USCS) logging methodology. Drill cuttings and rig activity were also

observed to identify lithologic contacts. Drill cuttings have been temporarily stored on-site on visquene plastic awaiting proper disposal.

#### **4.3 SOIL SAMPLING AND ANALYSIS**

During drilling activities, retrieved sediment samples were collected from the boreholes and analyzed in the field for total ionizable volatile compounds (TIVC) using a RAE-2000 Model photoionization detector (PID) utilizing a 10.6 eV lamp. 100 parts per million/volume (ppm/v) isobutylene span gas and ambient air were used to calibrate the PID prior to use.

Results of the field headspace and laboratory analyses are presented in Table 2 and Figures 6 and 7, and on the borehole logs presented in Appendix A. At each drilling location, discrete sediment samples were also collected using the USTR Methanol Extraction Method. These samples were shipped on ice to Pinnacle Laboratories Inc. (Pinnacle) for laboratory analyses. Laboratory soil samples were analyzed for the following parameters:

- ❑ Total Petroleum Hydrocarbons (C<sub>6</sub>-C<sub>36</sub> carbon range) (TPH<sub>gas-diesel range</sub>) using EPA Method 8015 (modified) (GC-FID) – [Select samples, TPH<sub>diesel range</sub>]
- ❑ Volatile Organic Compounds (VOCs) including BTEX, EDC, EDB, and MTBE using EPA Method 8260 (GC-MS)
- ❑ Polynuclear Aromatic (PNA) Compounds using EPA Method 8270 (SIMS) – [Select samples]
- ❑ Lead using EPA Method 6010/6020 (TCLP) – [Select samples]

During the Investigation, all soil samples were handled using strict Chain-of-Custody procedures. Laboratory reports including quality assurance/quality control data (QA/QC) and chain-of-custody documentation are presented in Appendix B.

#### **4.4 GROUND WATER SAMPLING AND ANALYSIS**

Two separate ground water sampling events were conducted in the Site Vicinity as part of the HI. On September 12, 2000 ground water samples were collected from ten of the previously installed monitor wells for laboratory analysis. On January 30, 2001, following completion of HI drilling, ground water samples were collected from the four newly installed and one previously installed monitor wells. Ground water laboratory analytical results are presented in Table 3 and Appendix B.

During each of the two sampling events, the water level in each well was measured and also

gauged for the presence of LNAPL. Temperature, pH and conductivity measurements were taken during well purging to document well stabilization. In order to purge and develop the monitor wells, between three to five well volumes were removed prior to collection of ground water samples using dedicated disposable bailers. Ground water samples were collected and stored in appropriate containers using the appropriate preservatives. A blind duplicate was collected from one of the monitor wells for QA/QC purposes during each sampling event. Samples were collected using strict chain-of-custody procedures, stored on ice in a cooler, and hand-delivered to Pinnacle Laboratory, Inc. in Albuquerque, New Mexico. Purge water was discharged to an on-site paved surface to allow volatilization of any VOCs as per NMED guidance documentation.

Laboratory ground water samples were analyzed for the following parameters:

- ❑ Volatile Organic Compounds (VOCs) including BTEX, EDC, EDB, tri-methyl benzenes (TMBs) and MTBE using EPA Method 8260 (GC-MS)
- ❑ Polynuclear Aromatic (PNA) Compounds using EPA Method 8310 (HPLC)
- ❑ Electron receptors ( $\text{SO}_4$ ,  $\text{NO}_3$ , Carbonates, and  $\text{Fe}_2$ ) using CHEMets Colorimetric Test Kits

## **5.0 RESULTS OF THE INVESTIGATION**

### **5.1 HYDROCARBON DISTRIBUTION IN SOIL**

Table 2 presents a summary of laboratory analytical results for soil samples collected during subsurface drilling operations at the Site. In addition, the magnitude and extent of soil TIVC and TPH in cross-sectional view and soil TPH in plan view are presented in Figures 4, 6, and 7. These data indicate that hydrocarbon releases in the Site vicinity are centered in the general vicinity of the former Climate Roofing UST system. Off-site migration has occurred primarily in an east-west direction (Figures 6 and 7). Based on drilling data, soil hydrocarbons exceeding TPH and/or TIVC levels extend off-site to the west-southwest beneath US Highway 314 (Isleta Blvd. SW).

The TIVC soil headspace plume is approximately 100 by 270 feet across. A smaller adsorbed-phase TPH core of soil contamination is present and is approximately 70 by 200 feet in size. In general soil contaminants are restricted to a thin zone at and below the current water table (Figure 4). On-site soil hydrocarbons are primarily in the gasoline range with lesser amounts of diesel range constituents (Figure 7). Knowledge of past site activities combined with analysis of laboratory chromatograms suggest diesel range hydrocarbons are actually kerosene in nature.

At present, soil hydrocarbons are characterized by moderate levels of gasoline range TPH, low levels of diesel range TPH, and low levels of BTEX compounds. Maximum TPH<sub>gasoline</sub>, TPH<sub>diesel</sub>, total BTEX and TMBs concentrations documented at the Site were 2,600 ppm, 3,318 ppm, 171 ppm, and 141 ppm, respectively.

Hydrocarbon saturated "highly contaminated" soils were not identified in the Site vicinity. However, typically the basal portions of Lithologic Unit I at the potentiometric surface exhibited the greatest hydrocarbon impacts in borehole samples analyzed from the Site. TIVC levels exceeded 100 ppm/v in 9 of the 17 boreholes advanced in the Site vicinity. TIVC levels in 6 of the soil borings exceeded 1,000 ppm/v (Figure 4).

Examination of soil laboratory data from samples collected from these locations (Figure 4) indicate the absence of benzene and toluene; lesser amounts ethyl benzene, total xylenes, TMBs and naphthalene are still present. Chromatographic analysis indicates substantial weathering of soil hydrocarbons has occurred at the Site. AS/VE remedial activities appear to have resulted in removal of the majority of lighter end BTEX and TPH compounds from both soils and ground water.

## **5.2 HYDROCARBON DISTRIBUTION IN GROUND WATER**

Ground water sampling data and chromatographic analysis suggest that remedial activities and natural biodegradation has stripped off lighter end BTEX components. Total xylenes and naphthalenes were the only components presently above NMWQCC and NMED/USTB standards. Figure 8 presents a summary of ground water quality and a total xylenes isoconcentration map. Table 3 and Figure 8 present detailed information on the distribution of hydrocarbon contaminants and inorganic ground water quality at the Site.

Trace to moderate levels of dissolved-phase toluene, ethylbenzene, total xylenes, TMB and naphthalenes are present in select ground water wells indicating that dissolved phase ground water contamination extends off-site to the west-southwest under Highway 314 (Isleta Blvd. SW). Maximum ethylbenzene ground water concentrations were measured at 420 ppb in FTW-16. Maximum total xylenes ground water concentrations were measured at 1500 ppb in the same monitor well. Maximum TMBs ground water concentrations were measured at 510 ppb in FTW-15 and maximum naphthalene concentrations were measured at 130 ppb in the same monitor well.

Due to health and safety hazards, drilling in the very heavily trafficked Highway 314 right-of-way was precluded. The horizontal extent of the ground water plume is determined at the Site with the exception of a small area west of FTW-16. However, MW-5 is located in the down gradient direction approximately 90 feet from FTW-16 and dissolved-phase ground water samples previously collected from this off-site down-gradient monitor well were found to be less than detection limits for contaminants of concern.

Inorganic water quality analyses of ground water samples collected from pre-existing and newly installed wells are presented in Table 3. Groundwater inorganic chemistry is dominated by moderate levels of bicarbonate ( $\text{HCO}_3$ ). Phosphate ( $\text{PO}_4$ ) concentrations in collected ground water samples were identified at low levels. Sulfate ( $\text{SO}_4$ ), and nitrate ( $\text{NO}_3$ ) concentrations in collected ground water samples were identified at trace levels or below analytical method detection limits. Total iron ( $\text{Fe}^2/\text{Fe}^3$ ) concentrations ranged from a low of 0.1 ppm to a high of 1.5 ppm.

## **5.3 RESIDUAL SPILL MASS ESTIMATES**

Preliminary estimates suggest that approximately 200 gallons of gasoline and kerosene are present as residual hydrocarbons in soils in the immediate vicinity of the Site. Based on

laboratory analysis, only about 20 percent of total hydrocarbons encountered at the Site appear to be kerosene fuel. Calculations are presented in Appendix D, which includes Figure A, Soil Residual Hydrocarbon Estimates Map.

## **6.0 CONCLUSIONS**

Based on the data collected during the Hydrogeologic Investigation, the following conclusions are presented:

- ❑ Site geology as observed in retrieved soil samples can be subdivided into two primary laterally extensive lithologic units (Figure 3). Lithologic Unit I is silt-rich. Lithologic Unit II is sand-rich.
- ❑ One hydrocarbon source area was identified during the HI located on-site near FTW-13 and B-6.
- ❑ During the Investigation, ground water was first encountered at depths of between 8 and 9 feet bsg. Ground water flow in the shallow aquifer was calculated to be west-southwest at a hydraulic gradient of approximately 0.0007 feet/foot.
- ❑ Residual gasoline and kerosene hydrocarbon impacts are present in on-and off-site soils in the vicinity of FTW-16 and are concentrated along or beneath the ground water table. The full extent of soil contaminants beneath Isleta Blvd has not been characterized due to health and safety considerations.
- ❑ Analysis of laboratory chromatograms and hydrocarbon range breakdowns indicate the gasoline hydrocarbons identified at the Site are consistent with heavily weathered gasoline with lesser amounts of kerosene. Remediation activities have preferentially removed the lighter end TPH compounds from soils and ground water at the Site.
- ❑ Calculations based on currently available data suggest approximately 200 gallons (1,200 lbs.) of residual hydrocarbons are present in soils in the Site vicinity. Approximately 700 gallons (4,200 lbs.) of TPH were removed during operation of the AS/VE system. Based on the above, greater than 77% of the TPH contamination at the Site was removed as a result of remedial system operation. It is likely that an even greater proportion of the original TPH was removed because the above calculations do not account for stimulated in-situ biodegradation as a result of system operation.
- ❑ The majority of residual TPH in soils and ground water at the Site are located west of the original AS/VE remediation system and extend beneath Isleta Blvd.

- Ground water concentrations have been generally decreasing over time and suggest the plume is in a state of “hydrodynamic equilibrium” or is decreasing in size.



## ***7.0 RECOMMENDATIONS***

Based on the information collected during this investigation and the requirements of the USTR Part XII, FEI/TPA recommend the following actions at the Site:

- ❑ Conduct a Tier One/Two RBCA evaluation to determine if any additional remedial efforts are necessary at the Site.
- ❑ Implement quarterly ground water monitoring at the Site to document plume stability and protect human health and the environment.
- ❑ Resolve remedial action options regarding right-of-way upgrades for the Isleta corridor.

## ***8.0 REFERENCES***

Kelly, T.E., 1977; Geology of the Albuquerque Basin, New Mexico; New Mexico Bureau of Mines and Minerals Resources, Memoir 33.

## ***9.0 STATEMENT OF FAMILIARITY***

We are personally familiar with the information presented in this report and it is accurate and complete to the best of our knowledge.

**Faith Engineering, Inc.**

**Tecumseh Professional Associates, Inc.**

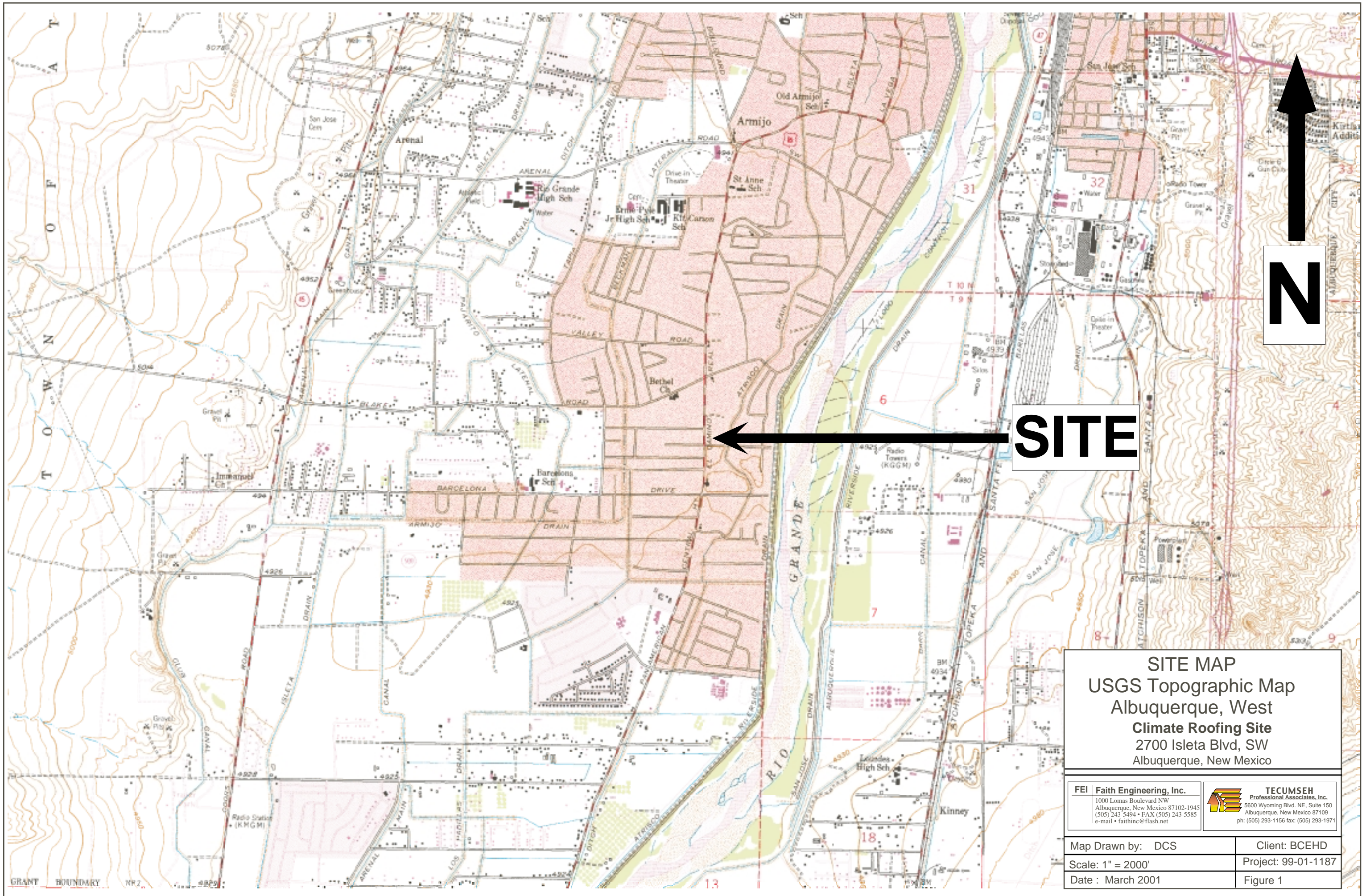
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Stuart E. Faith, PE  
President  
NMCS #80

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William J. Brown, CPG  
Senior Hydrogeologist  
NMCS #77





**SITE MAP**  
**USGS Topographic Map**  
**Albuquerque, West**  
**Climate Roofing Site**  
2700 Isleta Blvd, SW  
Albuquerque, New Mexico

**FEI** Faith Engineering, Inc.  
1000 Lomas Boulevard NW  
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**TECUMSEH**  
Professional Associates, Inc.  
5600 Wyoming Blvd. NE, Suite 150  
Albuquerque, New Mexico 87109  
ph: (505) 293-1156 fax: (505) 293-1971

Map Drawn by: DCS

Client: BCEHD

Scale: 1" = 2000'

Project: 99-01-1187

Date : March 2001

Figure 1



# SITE BASE MAP WITH CROSS SECTION LOCATIONS

**Climate Roofing Site**  
2700 Isleta Blvd, SW  
Albuquerque, New Mexico

FEI	<b>Faith Engineering, Inc.</b> 1000 Lomas Boulevard NW Albuquerque, New Mexico 87102-1945 (505) 243-5494 • FAX (505) 243-5585 e-mail • faithinc@flash.net	 <b>TECUMSEH</b> Professional Associates, Inc. 5600 Wyoming Blvd. NE, Suite 150 Albuquerque, New Mexico 87109 ph: (505) 293-1156 fax: (505) 293-1971

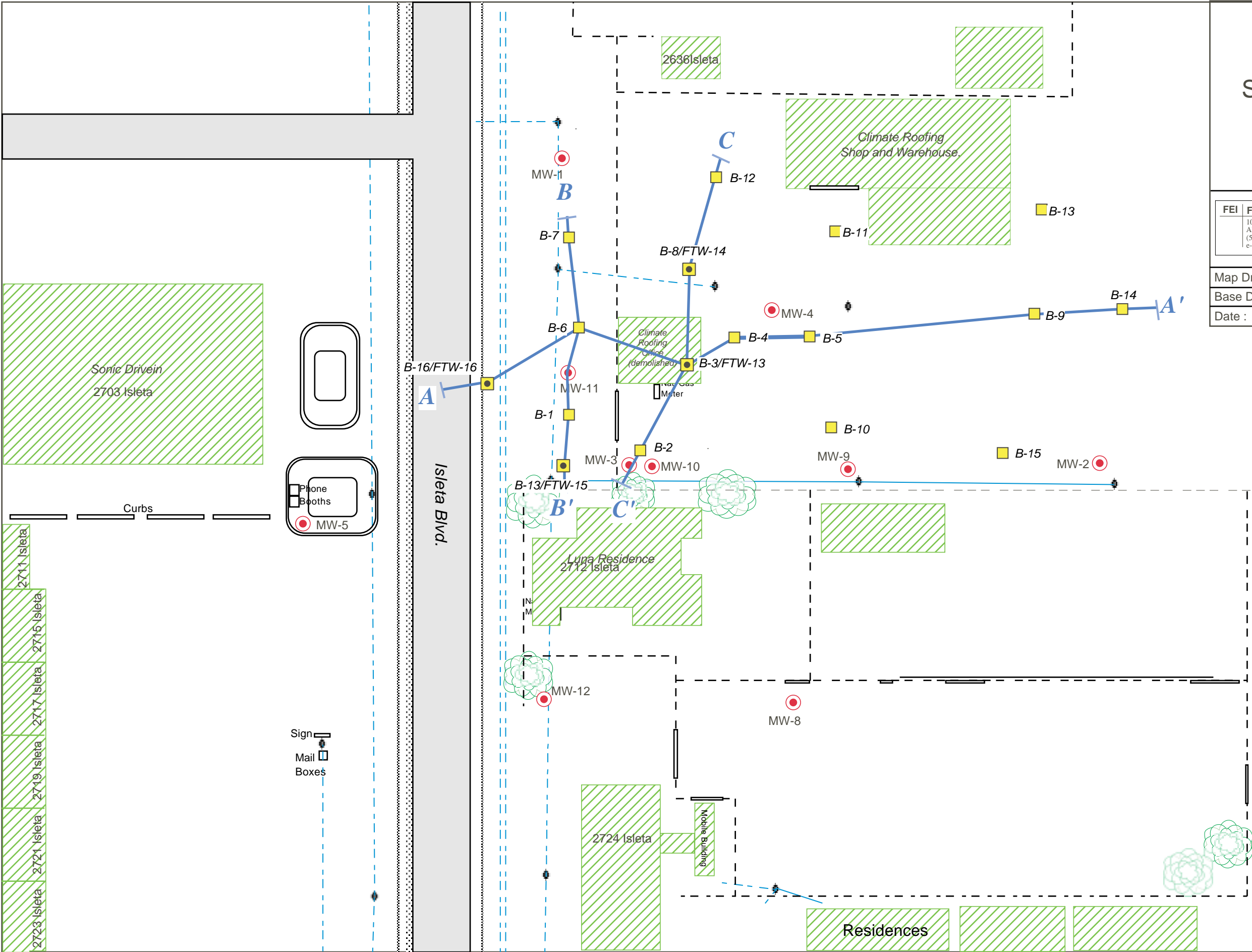
Map Drawn by: WJB	Client: BCEHD
Base Drawn by: KGF/WJB/ABL	Project: 99-00-1187
Date : February 2001	Figure 2

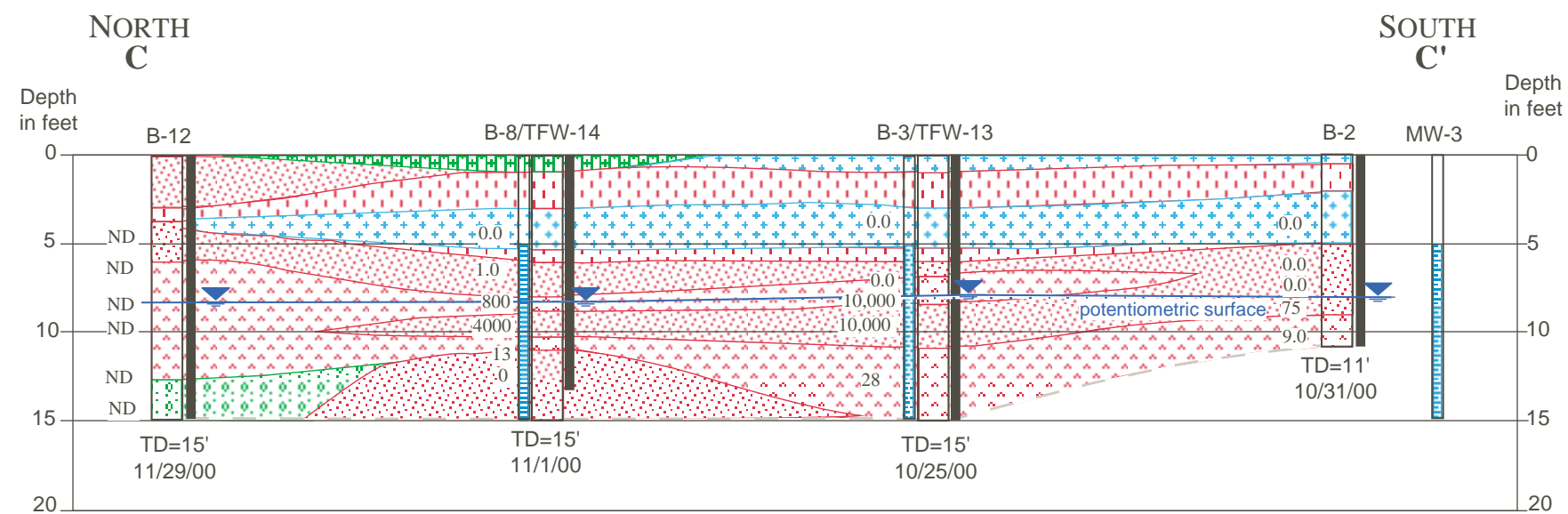
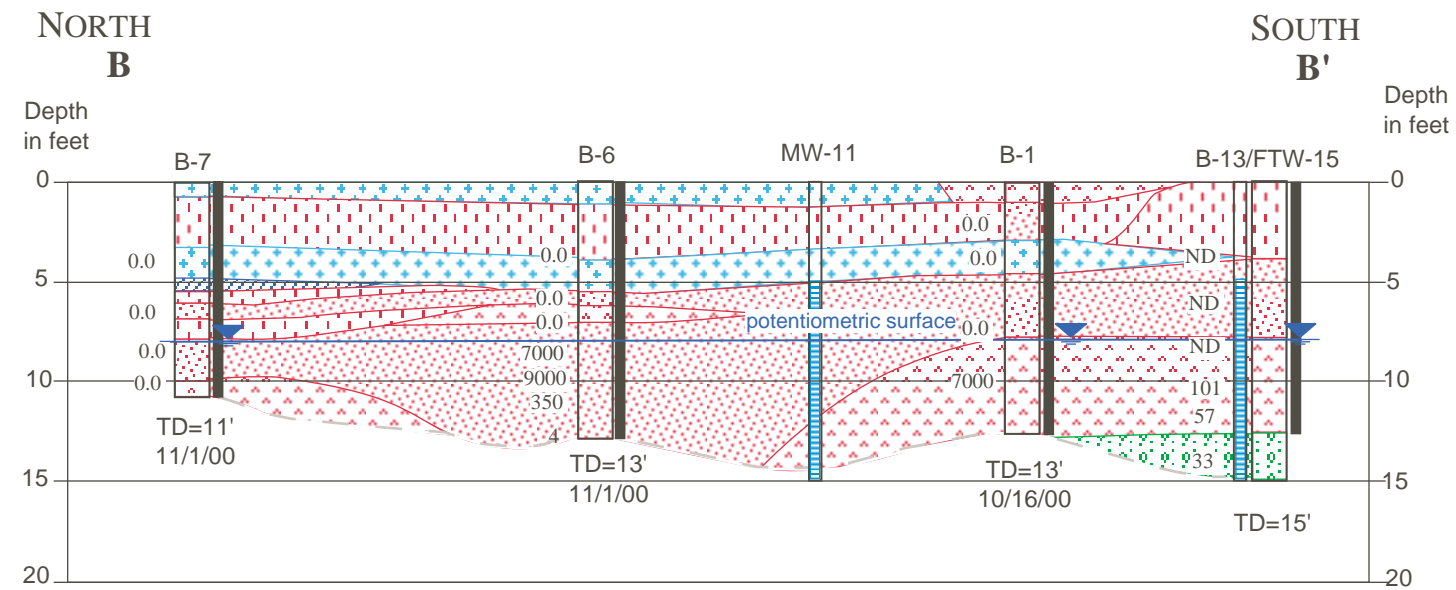
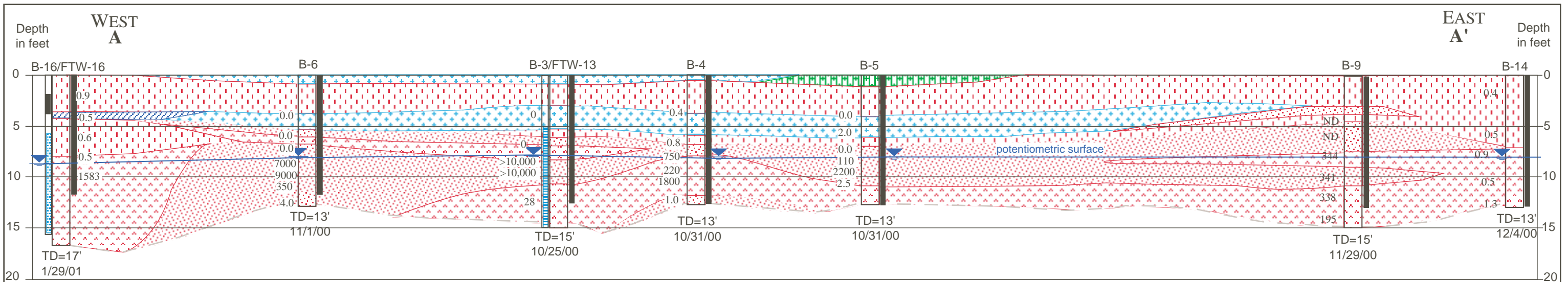
## LEGEND

- Newly Installed Soil Boring
- Newly Installed Monitor Well
- Existing Monitor Well Location
- Monitor Well Lost or Destroyed
- Location of Cross Section

- Utility Pole
- Building
- Gate in fence
- Fence Line
- Underground/overhead Utility
- Trees/Vegetation







0 40 ft  
Scale



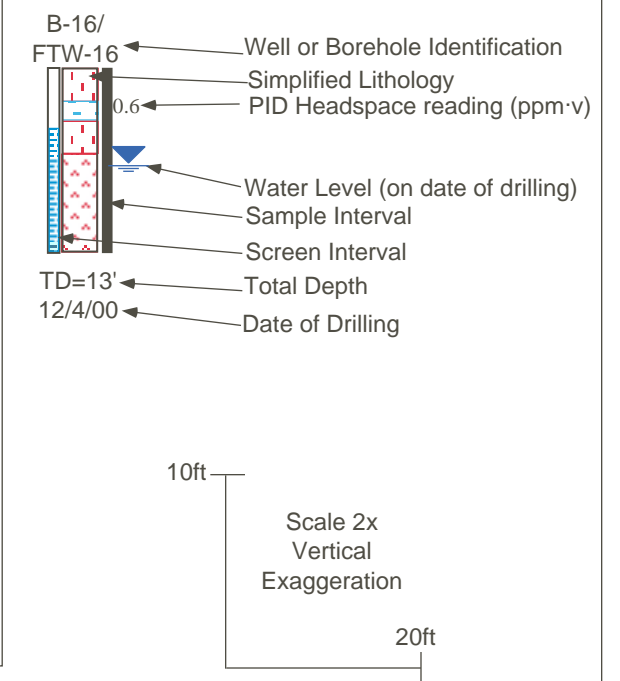


EXPLANATION:

Lithology

GW		Sandy Gravel
GM		Silty Gravel
SW		Poorly Sorted Medium to Coarse-Grained Sand with Clay and Minor Gravel
SP		Well Sorted Fine to Medium-Grained Sand
SM		Silty sands
SM/SC		Silty Clayey Very Fine-Grained Sand
SC		Clayey Sand
CL		Clay


This Cross Section is an interpretation of available data. Some variations may be expected from actual site conditions.



## SIMPLIFIED GEOLOGIC CROSS SECTIONS A-A', B-B', C-C'

**Climate Roofing Site**  
2700 Isleta Blvd, SW  
Albuquerque, New Mexico

<b>FEI</b>	<b>Faith Engineering, Inc.</b>
	1000 Lomas Boulevard NW Albuquerque, New Mexico 87102-1945 (505) 243-5494 • FAX (505) 243-5585 e-mail • <a href="mailto:faithinc@flash.net">faithinc@flash.net</a>

 **TECUMSEH**  
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ph: (505) 293-1156 fax: (505) 293-1971

Map Drawn by: WJB

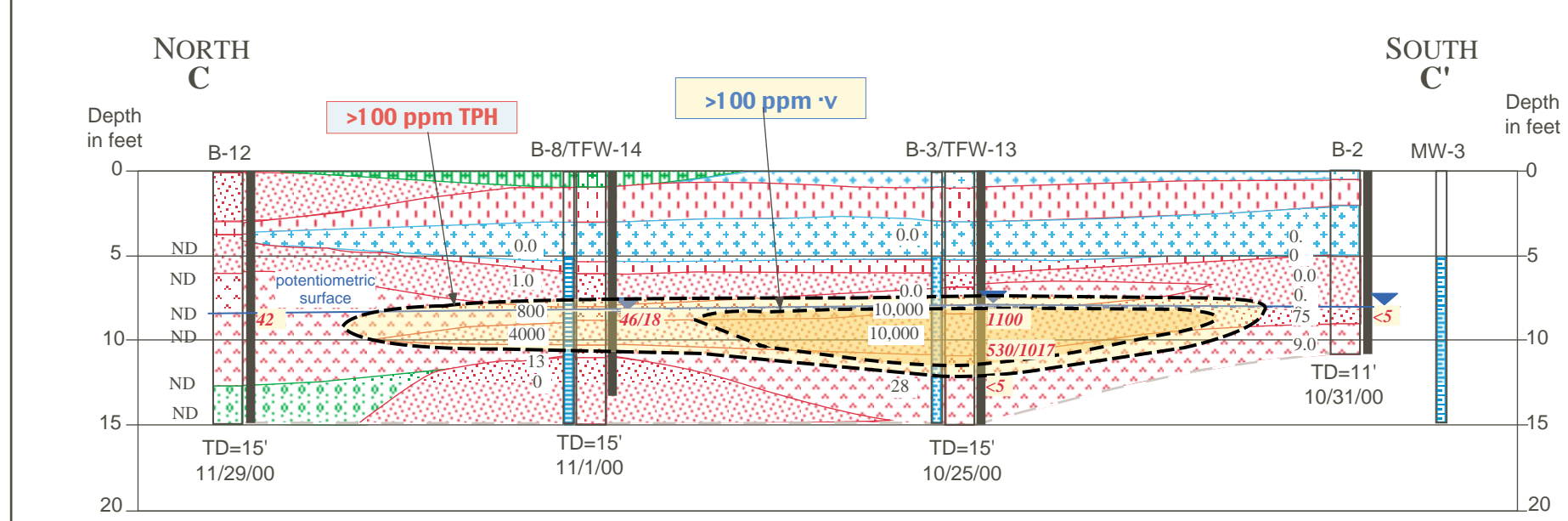
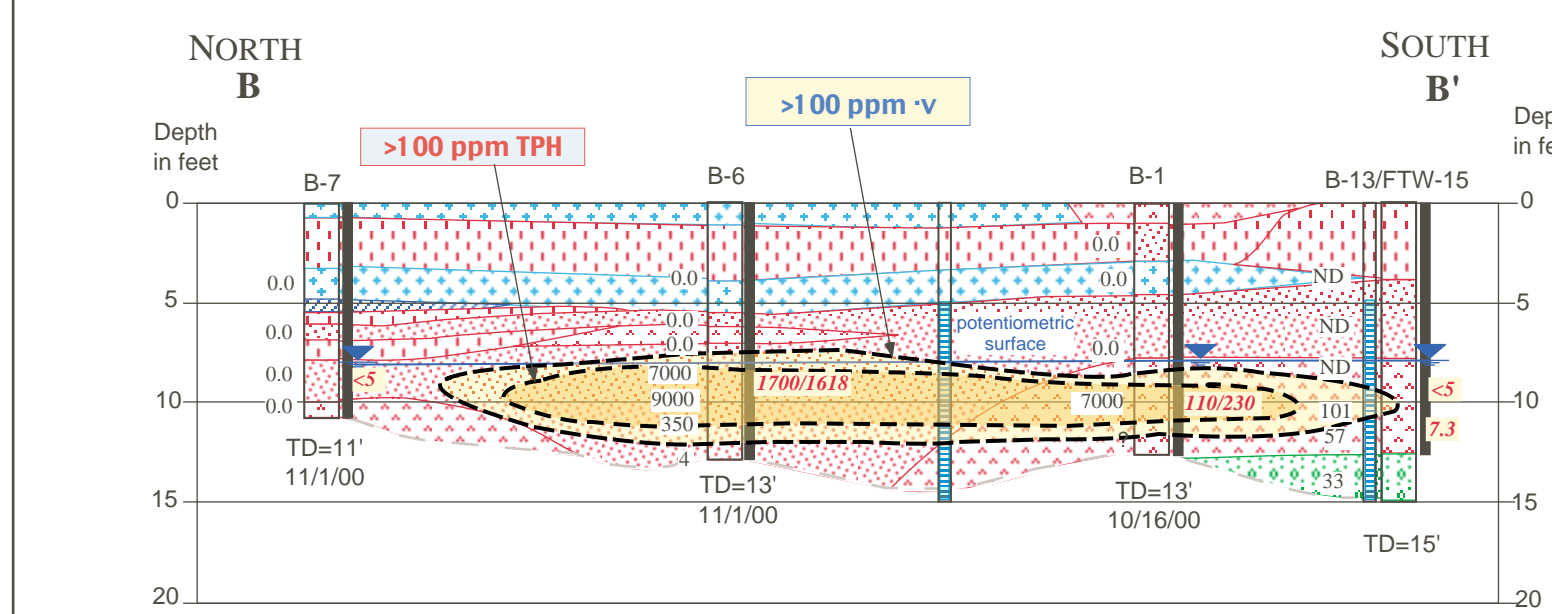
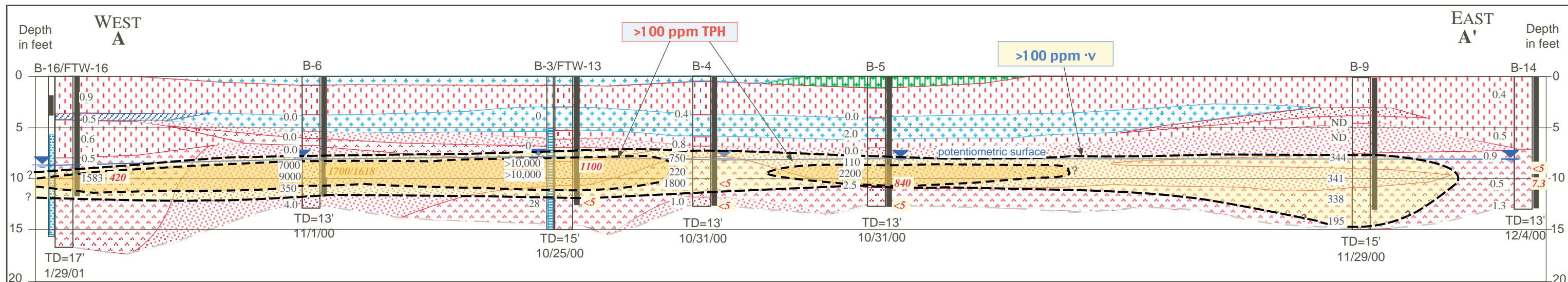
Client: BCEHD
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Drafted by: ABL

Project: 99-00-1187
---------------------

Date : February 2001

Figure 3



**EXPLANATION:**

**Lithology**

GW	Sandy Gravel
GM	Silty Gravel
SW	Poorly Sorted Medium to Coarse-Grained Sand with Clay and Minor Gravel
SP	Well Sorted Fine to Medium-Grained Sand
SM	Silty sands
SM/SC	Silty Clayey Very Fine-Grained Sand
SC	Clayey Sand
CL	Clay

This Cross Section is an interpretation of available data. Some variations may be expected from actual site conditions.

**Legend:**

- Well or Borehole Identification
- Simplified Lithology
- PID Headspace reading (ppm·v)
- TPH Gasoline Range in ppm
- TPH Diesel Range in ppm
- Water Level (on date of drilling)
- Sample Interval
- Screen Interval
- Total Depth
- Date of Drilling

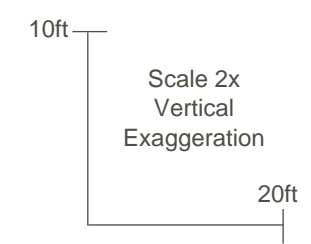
**100 PPM·V TIVC PID**

**Soil Headspace Total Ionizable Volatile Compounds Isoconcentration (In parts per million · volume (ppm·v))**

**100 PPM TPH**

**Soil Total Petroleum Hydrocarbons (TPH) Isoconcentration (In parts per million (ppm))**

\*ND = Non-Detectable



**SIMPLIFIED GEOLOGIC & CONTAMINANT CROSS SECTIONS A-A', B-B', C-C'**

**Climate Roofing Site**  
2700 Isleta Blvd, SW  
Albuquerque, New Mexico

<b>FEI</b> <b>Faith Engineering, Inc.</b> 1000 Lomas Boulevard NW Albuquerque, New Mexico 87102-1945 (505) 243-5494 • FAX (505) 243-5585 e-mail • faithinc@flash.net	<b>TECUMSEH</b> <b>Professional Associates, Inc.</b> 5600 Wyoming Blvd. NE, Suite 150 Albuquerque, New Mexico 87109 ph: (505) 293-1156 fax: (505) 293-1971
Map Drawn by: WJB	Client: BCEHD
Base Drawn by: ABL/WJB	Project: 99-00-1187
Date : February 2001	Figure 4

# GROUNDWATER POTENTIOMETRIC SURFACE MAP 9-12-00

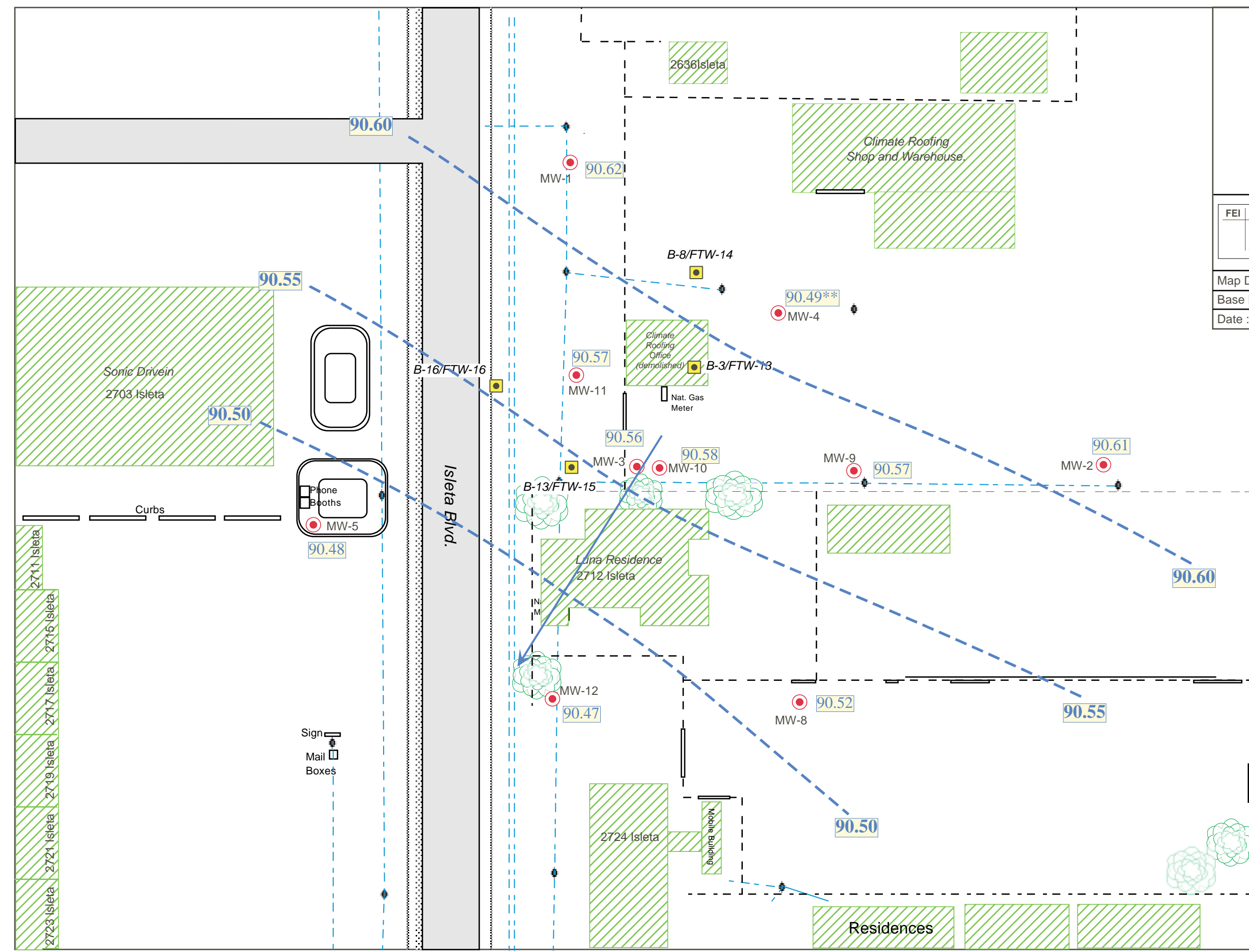
**Climate Roofing Site**  
2700 Isleta Blvd, SW  
Albuquerque, New Mexico

<b>FEI</b>	<b>Faith Engineering, Inc.</b> 1000 Lomas Boulevard NW Albuquerque, New Mexico 87102-1945 (505) 243-5494 • FAX (505) 243-5585 e-mail • faithinc@flash.net	<b>TECUMSEH</b> Professional Associates, Inc. 5600 Wyoming Blvd. NE, Suite 150 Albuquerque, New Mexico 87109 ph: (505) 293-1156 fax: (505) 293-1971
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Map Drawn by: WJB	Client: BCEHD
Base Drafted by: ABL	Project: 99-00-1187
Date : February 2001	Figure 5

## LEGEND

- Newly Installed Monitor Well
  - Existing Monitor Well Location
  - Groundwater Elevation
  - Inferred Groundwater Flow Direction
  - Groundwater Isocontour
  - Utility Pole
  - Building
  - Gate in fence
  - Fence Line
  - Underground/overhead Utility
  - Trees/Vegetation
- 0 40 ft  
Scale
- N





# SOIL HEADSPACE ISOCONCENTRATION MAP

**Climate Roofing Site**  
2700 Isleta Blvd, SW  
Albuquerque, New Mexico

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Map Drawn by: WJB

Client: BCEHD

Base Drawn by: KGF/WJB/ABL

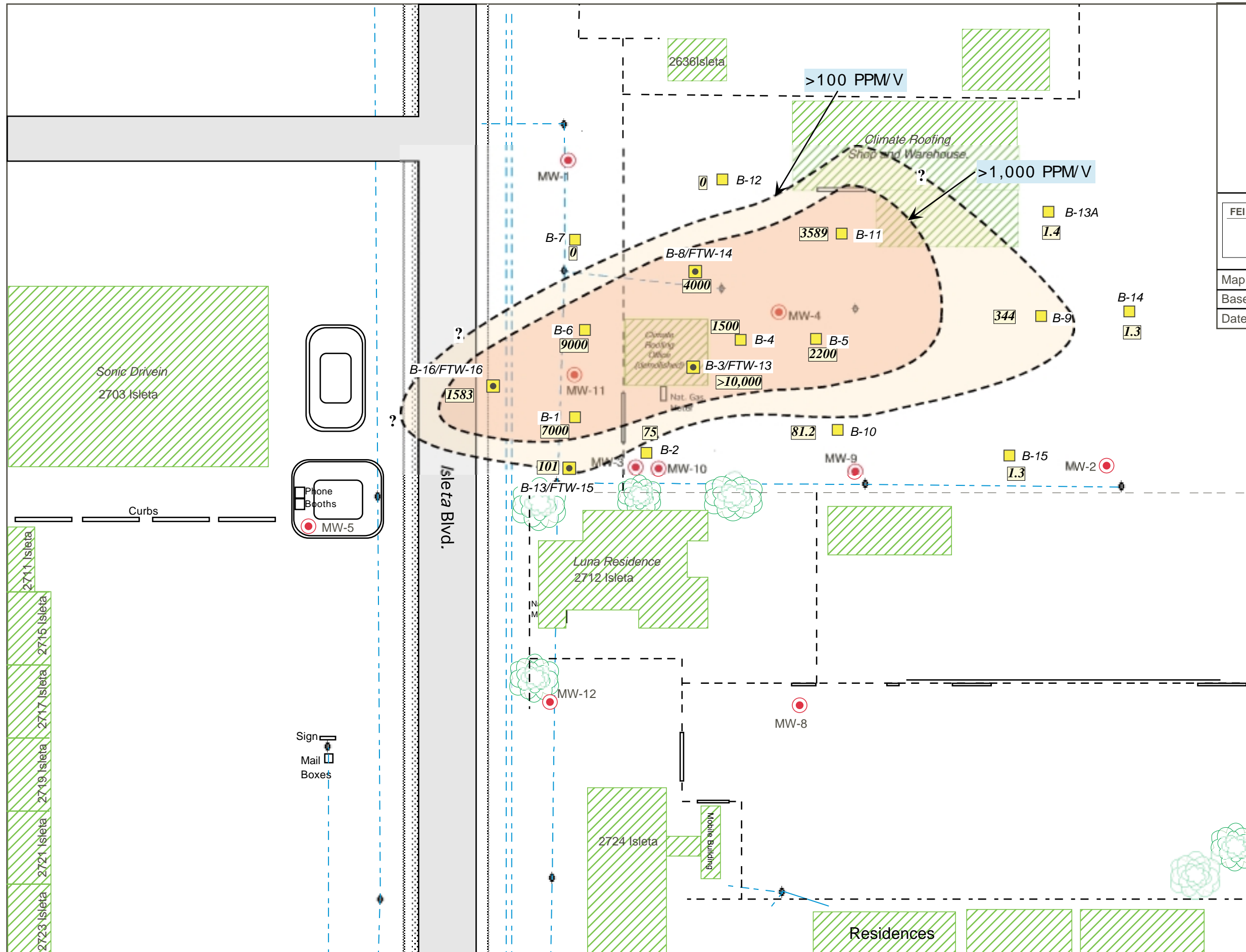
Project: 99-00-1187

Date : February 2001

Figure 6

## LEGEND

- Newly Installed Soil Boring
  - Newly Installed Monitor Well
  - Existing Monitor Well Location
  - Monitor Well Lost or Destroyed
  - Maximum Soil Headspace Concentration (In parts per million/volume (ppm/v))
  - Soil Headspace Isocontour (In parts per million/volume (ppm/v))
  - Utility Pole
  - Building
  - Gate in fence
  - Fence Line
  - Underground/overhead Utility
  - Trees/Vegetation
- 0 40 ft  
Scale
- N



SOIL TOTAL PETROLEUM  
HYDROCARBONS (TPH)  
ISOCONCENTRATION  
MAP

Climate Roofing Site  
2700 Isleta Blvd, SW  
Albuquerque, New Mexico

FEI

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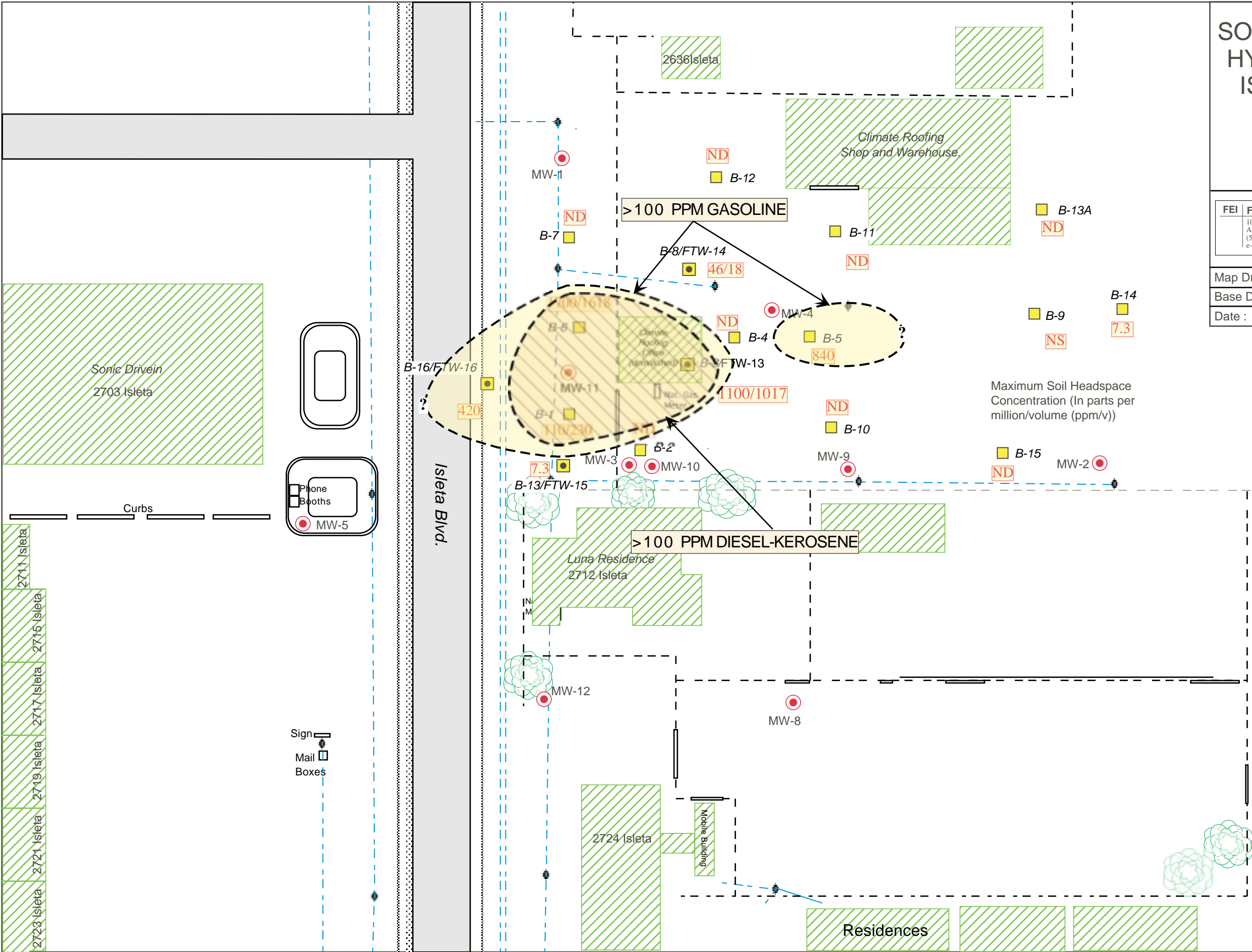
TECUMSEH

Professional Associates, Inc.  
5600 Wyoming Blvd. NE, Suite 150  
Albuquerque, New Mexico 87109  
ph: (505) 293-1156 fax: (505) 293-1971

Map Drawn by: WJB	Client: BCEHD
Base Drafted by: ABL	Project: 99-00-1187
Date : February 2001	Figure 7

LEGEND

- Newly Installed Soil Boring
- Newly Installed Monitor Well
- Existing Monitor Well Location
- Maximum Soil Total Petroleum Hydrocarbons (TPH) Concentration (In parts per million (ppm))
- Diesel-Kerosene Range TPH
- Gasoline Range TPH
- TPH Isocontour (in ppm)
- Building
- Gate in fence
- Fence Line
- Underground/overhead Utility
- Trees/Vegetation
- Utility Pole
- Scale



9-12-00 and 1-30-01
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### Climate Roofing Site

Albuquerque, New Mexico

Map Drawn by: WJB		Client: BCEHD
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Base Drafted by: ABL	Project: 99-00-1187
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### LEGEND

## Newly Installed Monitor

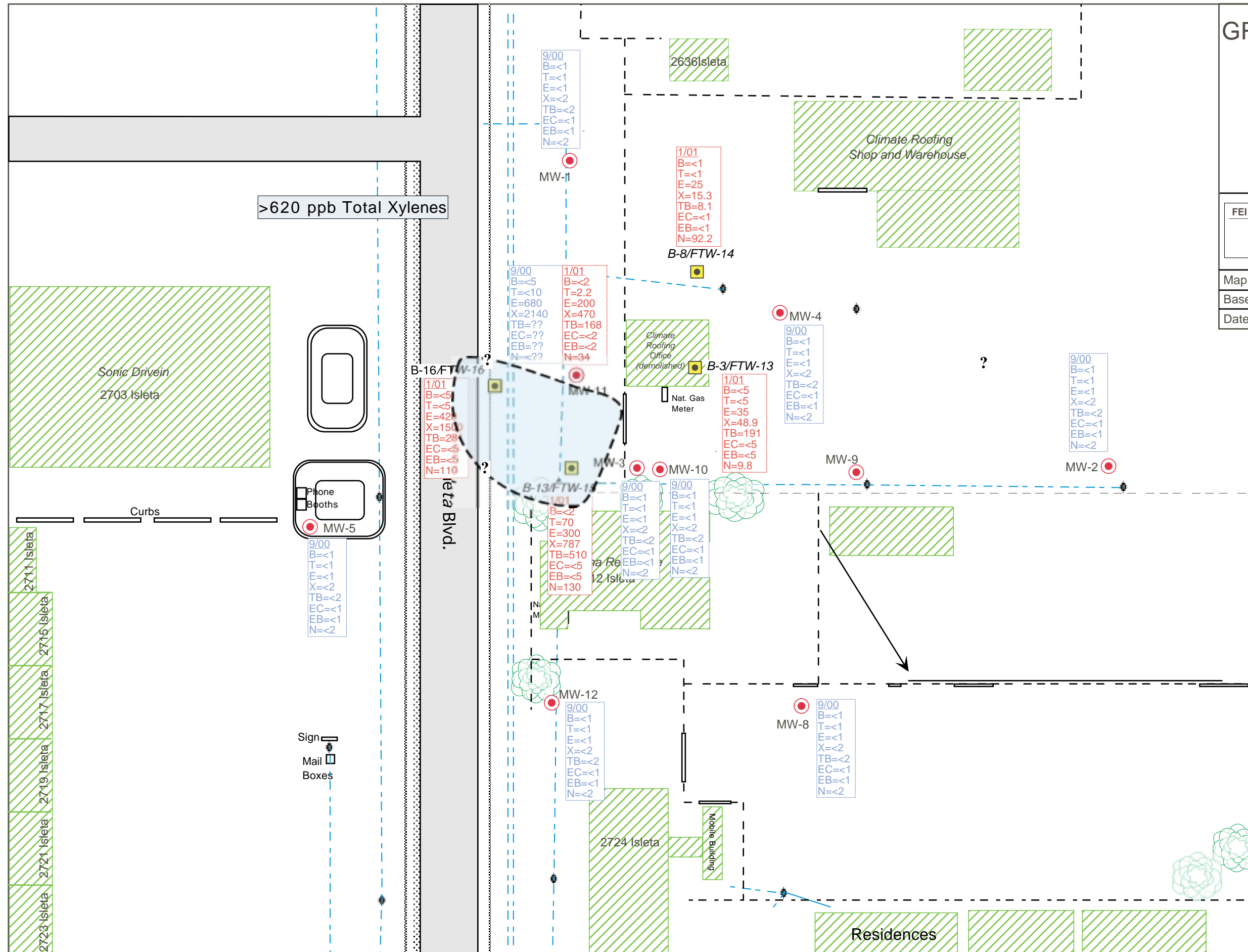
- Groundwater Quality Data (in ppb)

 Building

- 
- Trees/Vegetation

0 4

Scale



**TABLE 1**  
**Climate Roofing 2700 Isleta**  
**00-01-1187-03 • NMED Facility # 3245001**  
SUMMARY OF GROUND WATER LEVEL MEASUREMENTS

WELL NUMBER	ELEVATION * (feet above datum)	DATE	STATIC (feet BG)*	WATER LEVEL (feet AD)†	(+) = RISING (-) = FALLING
MW-1	98.82	12/18/90	8.13	90.69	
		5/30/91	7.88	90.94	0.25
		4/29/92	7.78	91.04	0.10
		5/25/93	7.91	90.91	-0.13
		8/25/93	8.40	90.42	-0.49
		11/15/93	7.91	90.91	0.49
		3/2/94	8.40	90.42	-0.49
		5/5/94	8.15	90.67	0.25
		8/26/94	8.18	90.64	-0.03
		12/8/94	7.96	90.86	0.22
		3/30/95	8.18	90.64	-0.22
		6/20/95	8.22	90.60	-0.04
		9/20/95	8.08	90.74	0.14
		12/19/95	7.99	90.83	0.09
		4/16/96	8.00	90.82	-0.01
		6/28/96	8.40	90.42	-0.40
		9/12/00	8.28	90.54	0.12
		1/30/01	8.20	90.62	0.08
MW-2	99.87	12/18/90	9.31	90.56	
		5/30/91	8.97	90.90	0.34
		4/29/92	8.86	91.01	0.11
		5/25/93	9.04	90.83	-0.18
		8/25/93	9.49	90.38	-0.45
		11/15/93	9.05	90.82	0.44
		3/2/94	9.52	90.35	-0.47
		5/5/94	9.04	90.83	0.48
		8/26/94	9.26	90.61	-0.22
		12/8/94	9.10	90.77	0.16
		3/30/95	9.26	90.61	-0.16
		6/20/95	9.26	90.61	0.00
		9/20/95	9.14	90.73	0.12
		12/19/95	9.12	90.75	0.02
		4/16/96	9.08	90.79	0.04
		6/28/96	9.48	90.39	-0.40
		9/12/00	9.23	90.64	0.25
		1/30/01	9.26	90.61	-0.03

**TABLE 1**  
**Climate Roofing 2700 Isleta**  
**00-01-1187-03 • NMED Facility # 3245001**  
SUMMARY OF GROUND WATER LEVEL MEASUREMENTS

WELL NUMBER	ELEVATION * (feet above datum)	DATE	STATIC (feet BG)*	WATER LEVEL (feet AD)†	(+) = RISING (-) = FALLING
MW-3	99.05	12/18/90	8.47	90.58	
		5/30/91	8.18	90.87	0.29
		4/29/92	8.09	90.96	0.09
		5/25/93	8.23	90.82	-0.14
		8/25/93	8.72	90.33	-0.49
		11/15/93	8.22	90.83	0.50
		3/2/94	8.70	90.35	-0.48
		5/5/94	8.38	90.67	0.32
		8/26/94	8.48	90.57	-0.10
		12/8/94	8.28	90.77	0.20
		3/30/95	8.46	90.59	-0.18
		6/20/95	8.64	90.41	-0.18
		9/20/95	8.38	90.67	0.26
		12/19/95	8.30	90.75	0.08
		4/17/96	8.28	90.77	0.02
		6/28/96	8.72	90.33	-0.44
		9/12/00	8.54	90.51	0.18
		1/30/01	8.49	90.56	0.05
MW-4	99.24	12/18/90	8.61	90.63	
		5/30/91	8.33	90.91	0.28
		4/29/92	8.21	91.03	0.12
		2/8/93	8.41	90.83	-0.20
		2/23/93	8.64	90.60	-0.23
		3/10/93	8.53	90.71	0.11
		5/25/93	8.33	90.91	0.20
		8/25/93	9.43	89.81	-1.10
		11/15/93	8.34	90.90	1.09
		3/2/94	8.82	90.42	-0.48
		5/5/94	8.54	90.70	0.28
		8/26/94	8.56	90.68	-0.02
		12/8/94	8.38	90.86	0.18
		3/30/95	8.58	90.66	-0.20
		6/20/95	8.86	90.38	-0.28
		9/20/95	8.46	90.78	0.40
		12/19/95	8.42	90.82	0.04
		4/17/96	8.39	90.85	0.03
		6/28/96	8.82	90.42	-0.43
		9/12/00	8.80	90.44	0.02
		1/30/01	8.75	90.49	0.05

**TABLE 1**  
**Climate Roofing 2700 Isleta**  
**00-01-1187-03 • NMED Facility # 3245001**  
SUMMARY OF GROUND WATER LEVEL MEASUREMENTS

WELL NUMBER	ELEVATION * (feet above datum)	DATE	STATIC (feet BG)*	WATER LEVEL (feet AD)†	(+) = RISING (-) = FALLING
MW-5	97.43	4/29/92	6.54	90.89	
		5/25/93	6.68	90.75	-0.14
		8/25/93	7.15	90.28	-0.47
		11/15/93	6.72	90.71	0.43
		3/2/94	7.20	90.23	-0.48
		5/5/94	6.76	90.67	0.44
		8/26/94	6.98	90.45	-0.22
		12/8/94	6.96	90.47	0.02
		3/30/95	6.76	90.67	0.20
		6/20/95	7.02	90.41	-0.26
		9/20/95	6.88	90.55	0.14
		12/19/95	6.82	90.61	0.06
		4/17/96	6.76	90.67	0.06
		6/28/96	7.18	90.25	-0.42
		9/12/00	7.03	90.40	0.15
		1/30/01	6.95	90.48	0.08
MW-6	99.37	12/18/90	8.76	90.61	
		5/30/91	8.44	90.93	0.32
		4/29/92	8.32	91.05	0.12
		1/25/93	8.76	90.61	-0.44
		2/8/93	8.74	90.63	0.02
		2/23/93	8.78	90.59	-0.04
		3/10/93	8.66	90.71	0.12
		5/25/93	8.48	90.89	0.18
		11/15/93	8.50	90.87	-0.02
		3/2/94	8.98	90.39	-0.48
		5/5/94	8.56	90.81	0.42
		8/26/94	8.72	90.65	-0.16
		12/8/94	8.54	90.83	0.18
		3/30/95	8.74	90.63	-0.20
		6/20/95	8.82	90.55	-0.08
		9/20/95	8.60	90.77	0.22
		12/19/95	8.56	90.81	0.04
		4/17/96	8.54	90.83	0.02
		6/28/96	8.96	90.41	-0.42

**TABLE 1**  
**Climate Roofing 2700 Isleta**  
**00-01-1187-03 • NMED Facility # 3245001**  
SUMMARY OF GROUND WATER LEVEL MEASUREMENTS

WELL NUMBER	ELEVATION * (feet above datum)	DATE	STATIC (feet BG)*	WATER LEVEL (feet AD)†	(+) = RISING (-) = FALLING
MW-7	99.15	4/29/92	8.63	90.52	
		1/25/93	8.56	90.59	0.07
		2/8/93	8.21	90.94	0.35
		2/23/93	8.58	90.57	-0.37
		3/10/93	8.48	90.67	0.10
		5/25/93	8.28	90.87	0.20
		8/25/93	9.33	89.82	-1.05
		11/15/93	8.28	90.87	1.05
		3/2/94	8.78	90.37	-0.50
		5/5/94	8.52	90.63	0.26
		8/26/94	8.50	90.65	0.02
		12/8/94	8.32	90.83	0.18
		3/30/95	8.50	90.65	-0.18
		6/20/95	8.90	90.25	-0.40
		9/20/95	8.42	90.73	0.48
		12/19/95	8.36	90.79	0.06
		4/17/96	8.34	90.81	0.02
		6/28/96	8.78	90.37	-0.44
MW-8	99.01	12/18/90	8.49	90.52	
		5/30/91	8.18	90.83	0.31
		4/29/92	8.07	90.94	0.11
		5/25/93	8.24	90.77	-0.17
		8/25/93	8.68	90.33	-0.44
		5/5/94	8.24	90.77	0.44
		6/20/95	8.48	90.53	-0.24
		9/20/95	8.36	90.65	0.12
		12/19/95	8.34	90.67	0.02
		4/16/96	8.32	90.69	0.02
		6/28/96	8.70	90.31	-0.38
		9/12/00	8.50	90.51	0.20
		1/30/01	8.49	90.52	0.01

**TABLE 1**  
**Climate Roofing 2700 Isleta**  
**00-01-1187-03 • NMED Facility # 3245001**  
SUMMARY OF GROUND WATER LEVEL MEASUREMENTS

WELL NUMBER	ELEVATION * (feet above datum)	DATE	STATIC (feet BG)*	WATER LEVEL (feet AD)†	(+) = RISING (-) = FALLING
MW-9	99.11	2/8/93	8.51	90.60	
		2/23/93	8.58	90.53	-0.07
		3/10/93	8.46	90.65	0.12
		5/25/93	8.28	90.83	0.18
		8/25/93	8.80	90.31	-0.52
		11/15/93	8.30	90.81	0.50
		3/2/94	8.78	90.33	-0.48
		5/5/94	8.38	90.73	0.40
		8/26/94	8.50	90.61	-0.12
		12/8/94	8.34	90.77	0.16
		3/30/95	8.50	90.61	-0.16
		6/20/95	8.68	90.43	-0.18
		9/20/95	8.40	90.71	0.28
		12/19/95	8.35	90.76	0.05
		4/17/96	8.34	90.77	0.01
		6/28/96	8.74	90.37	-0.40
		9/12/00	8.53	90.58	0.21
		1/30/01	8.54	90.57	-0.01
MW-10	99.28	4/29/92	8.31	90.97	
		5/25/93	8.45	90.83	-0.14
		8/25/93	8.98	90.30	-0.53
		11/15/93	8.47	90.81	0.51
		3/2/94	8.94	90.34	-0.47
		5/5/94	8.62	90.66	0.32
		8/26/94	8.70	90.58	-0.08
		12/8/94	8.52	90.76	0.18
		3/30/95	8.70	90.58	-0.18
		6/20/95	8.86	90.42	-0.16
		9/20/95	8.60	90.68	0.26
		12/19/95	8.56	90.72	0.04
		4/17/96	8.55	90.73	0.01
		6/28/96	8.96	90.32	-0.41
		9/12/00	8.76	90.52	0.20
		1/30/01	8.70	90.58	0.06



**TABLE 1**  
**Climate Roofing 2700 Isleta**  
**00-01-1187-03 • NMED Facility # 3245001**  
SUMMARY OF GROUND WATER LEVEL MEASUREMENTS

WELL NUMBER	ELEVATION * (feet above datum)	DATE	STATIC (feet BG)*	WATER LEVEL (feet AD)†	(+) = RISING (-) = FALLING
MW-11	98.83	8/25/93	8.49	90.34	
		11/15/93	7.49	91.34	1.00
		3/2/94	8.48	90.35	-0.99
		5/5/94	8.38	90.45	0.10
		8/26/94	8.24	90.59	0.14
		12/8/94	8.04	90.79	0.20
		3/30/95	8.23	90.60	-0.19
		6/20/95	8.44	90.39	-0.21
		9/20/95	8.14	90.69	0.30
		12/19/95	8.08	90.75	0.06
		4/17/96	8.08	90.75	0.00
		6/28/96	8.46	90.37	-0.38
		9/12/00	8.33	90.50	0.13
		1/30/01	8.26	90.57	0.07
MW-12	98.13	4/29/92	7.23	90.90	
		5/25/93	7.37	90.76	-0.14
		8/25/93	7.84	90.29	-0.47
		11/15/93	7.40	90.73	0.44
		3/2/94	7.86	90.27	-0.46
		5/5/94	7.42	90.71	0.44
		8/26/94	7.60	90.53	-0.18
		12/8/94	7.42	90.71	0.18
		3/30/95	7.64	90.49	-0.22
		6/20/95	7.64	90.49	0.00
		9/20/95	7.52	90.61	0.12
		12/19/95	7.48	90.65	0.04
		4/17/96	7.48	90.65	0.00
		6/28/96	8.46	89.67	-0.98
		9/12/00	7.68	90.45	0.78
		1/30/01	7.66	90.47	0.02

**TABLE 1**  
**Climate Roofing 2700 Isleta**  
**00-01-1187-03 • NMED Facility # 3245001**  
SUMMARY OF GROUND WATER LEVEL MEASUREMENTS

WELL NUMBER	ELEVATION * (feet above datum)	DATE	STATIC (feet BG)*	WATER LEVEL (feet AD)†	(+) = RISING (-) = FALLING
MW-13	98.95	2/23/93	8.36	90.59	
		3/10/93	8.27	90.68	0.09
		5/25/93	8.08	90.87	0.19
		8/25/93	8.92	90.03	-0.84
		11/15/93	8.04	90.91	0.88
		3/2/94	8.56	90.39	-0.52
		5/5/94	8.28	90.67	0.28
		8/26/94	8.30	90.65	-0.02
		12/8/94	8.12	90.83	0.18
		3/30/95	8.30	90.65	-0.18
		6/20/95	8.96	89.99	-0.66
		9/20/95	8.18	90.77	0.78
		12/19/95	12.78	86.17	-4.60
		4/17/96	8.12	90.83	4.66
		6/28/96	8.55	90.40	-0.43

Data checked \_\_\_\_\_ / \_\_\_\_\_

**TABLE 2**  
**Climate Roofing 2700 Isleta**  
**00-01-1187-03 • NMED FACILITY # 3245001**  
SUMMARY OF SOIL LABORATORY ANALYTICAL DATA

		ORGANICS										HYDROCARBONS				
LOCATION	DATE SAMPLED	Benzene	Toluene	Ethylbenzene	Total Xylenes	Total BTEX	MTBE	EDB	EDC	TMB	NAPHTHALENE	TPH C6-C14 8015 GRO	C6-C10 8015 Mod	C10-C22 8015 Mod	C22-C36 8015 Mod	Total TPH 8015 Mod
UNITS		mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg	mg/Kg
STANDARDS		10				50						100				100
B-1-12-12.5 (SW)	10/16/00	<0.05	0.25	5.8	19.2	25.25	<0.05	<0.05	<0.05	10.3	2.4	*	110	230	<10	340
B-2-8'-9' (SP)	10/31/00	< 0.05	< 0.05	< 0.05	<0.1	< 0.25	< 0.05	< 0.05	< 0.05	<0.1	< 0.05	< 5.0	*	*	*	*
B-4-10.5' (SP/SW)	10/31/00	< 0.05	< 0.05	< 0.05	<0.1	< 0.25	< 0.05	< 0.05	< 0.05	<0.1	< 0.05	< 5.0	*	*	*	*
B-4-13' (SP)	10/31/00	< 0.05	< 0.05	< 0.05	<0.1	< 0.25	< 0.05	< 0.05	< 0.05	<0.1	< 0.05	< 5.0	*	*	*	*
B-5-10.5' (SP)	10/31/00	< 0.05	0.15	1.6	3.37	5.12	< 0.05	< 0.05	< 0.05	<0.1	0.44	840	*	*	*	*
B-5-13' (SP/SW)	10/31/00	< 0.05	< 0.05	< 0.05	<0.1	< 0.25	< 0.05	< 0.05	< 0.05	<0.1	< 0.05	< 5.0	*	*	*	*
B-6-10' (SP)	11/1/00	< 0.5	< 0.5	41	130	171	< 0.5	< 0.5	< 0.5	141	11	2600	1700	1600	18	3318
B-7-9' (SP)	11/1/00	< 0.05	< 0.05	< 0.05	<0.1	< 0.25	< 0.05	< 0.05	< 0.05	<0.1	< 0.05	< 5.0	*	*	*	*
B-8/FTW-14-9' (SM)	11/1/00	< 0.05	< 0.05	0.18	<0.1	< 0.25	< 0.05	< 0.05	< 0.05	<0.1	< 0.05	100	< 10	46	18	64
B-10, 10'-11' (SW)	12/8/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	39	*	*	*	*
B-11, 10'-11' (SW)	12/8/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 5.0	*	*	*	*
B-12, 9'-10' (SW)	12/8/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	42	*	*	*	*
B-13/FTW-15, 10'-11' (SW)	12/8/00	< 0.05	< 0.05	0.38	< 0.68	< 1.06	< 0.05	< 0.05	< 0.05	0.36	0.11	7.3	*	*	*	*
B-13A, 9.5-10.0 (SM)	12/5/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 5.0	*	*	*	*
B-14, 10.0-10.5 (SP)	12/4/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 5.0	*	*	*	*
B-15, 9.5-10.0 (SM)	12/5/00	< 0.05	< 0.05	< 0.05	< 0.1	< 0.25	< 0.05	< 0.05	< 0.05	< 0.1	< 0.05	< 5.0	*	*	*	*
B-3/FTW-13-9' (SP)	10/31/00	< 0.05	< 0.05	0.2	1.05	1.25	< 0.05	< 0.05	< 0.05	6.1	< 0.05	1100	*	*	*	*
B-3/FTW-13-11' (SP)	10/31/00	< 0.05	< 0.05	0.1	<0.24	< 0.34	< 0.05	< 0.05	< 0.05	7.3	< 0.05	610	530	1000	17	1547
B-3/FTW-13-13' (SP/SW)	10/31/00	< 0.05	< 0.05	< 0.05	<0.1	< 0.25	< 0.05	< 0.05	< 0.05	<0.1	< 0.05	< 5.0	*	*	*	*
B-16/FTW-16-9.5' (SW)	1/29/01	< 0.25	< 0.25	2.2	<3.25	< 5.45	< 0.25	< 0.25	< 0.25	2.93	0.73	420	160	220	<10	380

**BOLD** - Above NMED Standards

Data checked \_\_\_\_\_ / \_\_\_\_\_

Faith Engineering, Inc  
4/2/01

**TABLE 3**  
**Climate Roofing 2700 Isleta**  
**00-01-1187-03 • NMED FACILITY # 3245001**  
SUMMARY OF GROUND WATER ANALYTICAL DATA

		ORGANICS									INORGANICS							INDICATORS			
LOCATION	DATE SAMPLED	Benzene	Toluene	Ethylbenzene	Total Xylenes	MTBE	EDB	EDC	TMB	NAPHTHALENE	IRON	PHOSPHATE	SULFIDE	ALKALINITY as CaCO3	DISS O2		NITRATE	pH	CONDUCTIVITY	TEMP	
		µg/l 10	µg/l 750	µg/l 750	µg/l 620	µg/l 100	µg/l 0.1	ug/l 10	µg/l	ug/l 30		µg/l SOLUBLE	µg/l TOTAL	mg/l	mg/l	mg/l	mg/l METER				mg/l FIELD
MW - 1	9/12/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.1	0.2	2.0	0.0	350	*	1.5	0.8	6.95	2333	22.9
MW - 2	9/12/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.0	0.0	0.0	0.0	125	*	2.0	0.1	6.71	573	23.6
MW - 3	9/12/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.4	0.4	7.0	0.0	300	*	0.0	0.3	6.81	1135	22.9
MW - 4	9/12/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.2	0.3	2.0	0.0	300	*	0.5	0.4	7.14	1167	20
MW - 5	9/12/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.1	0.3	3.0	0.0	400	*	1.0	1.0	6.78	1941	26.5
MW - 8	9/12/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.0	0.1	1.0	0.0	225	*	0.5	2.0	7.33	873	23.3
MW - 9	9/12/00	< 1.0	< 1.0	15	< 2.1	< 1.0	< 1.0	< 1.0	< 6.6	2.7	0.1	0.1	2.0	0.0	132	*	1.0	0.4	7.4	790	21.8
MW - 10	9/12/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.0	0.2	14.0	0.0	300	*	0.5	0.6	6.7	1654	19
MW - 11	9/12/00	< 5.0	10	680	2140	< 5.0	< 5.0	< 5.0	690	170	0.1	0.1	2.0	2.0	300	*	0.5	0.4	7.45	1734	23.2
MW - 12	9/12/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	0.3	0.3	2.0	0.0	250	*	0.5	1.0	7.31	250	23.9
Rinsate	9/11/00	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	< 1.0	< 1.0	< 2.0	< 1.0	*	*	*	*	*	*	*	*	*	*	*
MW - 11	1/30/01	< 2.0	2.2	200	470	< 2.0	< 0.01	< 2.0	168	34	0.0	0.2	0.2	4.0	350	0.49	0.5	0.4	7.56	156	14.5
FTW - 13	1/30/01	< 5.0	< 5.0	35	48.9	< 5.0	< 0.01	< 5.0	191	9.8	0.3	0.6	1.5	2.0	295	0.25	0.0	0.6	7.66	111.4	13.9
FTW - 14	1/30/01	< 1.0	< 1.0	25	15.3	< 1.0	< 0.01	< 1.0	8.1	2.2	0.2	0.2	0.6	3.0	295	0.62	1.0	0.6	7.63	166.2	12.7
FTW - 15	1/30/01	< 2.0	70	300	787.5	< 2.0	< 0.01	< 2.0	510	130	0.4	0.6	0.6	1.5	295	0.44	0.5	0.6	7.75	108.5	12.5
FTW - 16	1/30/01	< 5.0	< 5.0	420	<1505	< 5.0	< 0.01	< 5.0	281	110	0.4	1.5	1.0	5.0	500	0.65	1.5	1.0	7.70	148.2	14.6

Data checked \_\_\_\_\_ / \_\_\_\_\_

## **APPENDIX A**

### **Borehole Lithologic Logs**

SITE ID: **CLIMATE ROOFING**  
 CLIENT: **BCEHD**  
 BOREHOLE ID: **B-1** PAGE 1 OF 1

DATE OF DRILLING: 10-16-00  
 LOGGED BY: R. Sengebush  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 5' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: 8.1ft  
 TOTAL DEPTH: 13ft  
 CASING: NA  
 SCREEN: NA  
 SURFACE COMPLETION: Native Fill

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	Sample Interval	SIMPLIFIED LITHOLOGY
	Clean Drill Cuttings	70%		0.0	2		
				0.0	4		
				0.0	6		
				0.0	8		
	Bentonite Pellets (hydrated)	30%		7000.	10		
			B-1 12-12.5' (SW) 110/230		2		
					4		
					6		
					8		
					20		

Surface Conditions: Soil-hand dug to 3 ft.

0.0'-1.0' Fill (SW) Pea gravel and silt 1.0'-3.0' (SP) 10 YR Brownish-yellow; sand; fine to medium-grained; very well sorted; damp; no apparent hydrocarbon odor present; (cuttings).

3.0'-8.0' 3.5' sample in split spoon. 3.0'-4.5' (ML) 10YR yellowish-brown; silt; very well sorted; dry; no apparent hydrocarbon odor present. 4.5'-5.0' (SP) 10YR light brown; sand; very fine-grained; very well sorted; dry; no apparent hydrocarbon odor present. 5.0'-8.0' (SP) 10YR light brown; sand; fine to medium-grained very well sorted; dry; no apparent hydrocarbon odor present.

8.0'-13.0' 2.5' sample in split spoon. 8.0'-8.3' (SP) 10YR light brown (as above); H2O saturated. 8.3'-10.5' (SW) 10YR Brown-gray (N5); sand; medium to coarse-grained; poorly sorted; 5% gravel; saturated; strong petroleum odor. (Measure DTW @ 1537, 8.1ft bgs).

TOTAL DEPTH: 13ft bgs



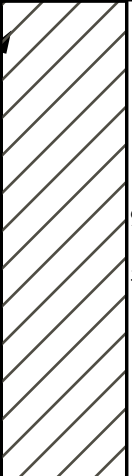
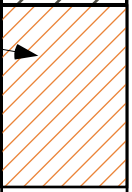
**TECUMSEH PROFESSIONAL ASSOCIATES, INC.**

5600 WYOMING BOULEVARD, NE., SUITE 150, ALBUQUERQUE, NEW MEXICO 87113  
 PHONE: (505) 293-1156 FAX: (505) 293-1971

SITE ID: CLIMATE ROOFING  
 CLIENT: BCEHD  
 BOREHOLE ID: B-2 PAGE 1 OF 1

DATE OF DRILLING: 10-31-00  
 LOGGED BY: W. Brown  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8" nominal  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: 8.5-9.0 ft  
 TOTAL DEPTH: 11ft  
 CASING: NA  
 SCREEN: NA  
 SURFACE COMPLETION: Native Fill

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	Sample Interval	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout		9/11/13/15 53%		0.0	4		
		6/7/7/9 90%		0.0	6		
Bentonite Pellets (hydrated)		3/4/6/5 90%	B-2 8-9' (SP)	0.0	8		
		3/6/5/4 85%		75	10		
				9	10		
					2		
					4		
					6		
					8		
					10		
					12		
					14		
					16		
					18		
					20		

Surface Conditions: Loose dirt.

0.0'-0.5' **(SC)** Dark brown; silty clayey sand; unconsolidated; some organic matter; moist; no apparent hydrocarbon odor present; (cuttings).

0.5'-3.0' **(SM)** (7.5YR) Reddish-yellow; silty sand; unconsolidated; slightly moist; no apparent hydrocarbon odor present; (cuttings).

3.0'-5.0' 1.1' sample in split spoon. 0.0'-0.1' **(Cave-in)** 0.0'-0.4' **(SM)** As above. 0.4'-1.1' **(SC/SM)** Silty clayey sand; very fine-grained; with disseminated CaCO<sub>3</sub> cement; hard; slightly moist; no apparent hydrocarbon odor present.

5.0'-7.0' 1.8' sample in split spoon. 0.0'-0.4' **(SM/SC)** As above; (10YR) Brown. 0.4'-1.8' **(SM/SP)** Brown to light brown (10YR) with one 2" thick dark brown zone @ 1.4'-1.6' depth; sand with minor silt; very fine to fine-grained; unconsolidated; moist to very moist @ base; no apparent hydrocarbon odor present.

7.0'-9.0' 1.8' sample in split spoon. 0.0'-0.2' **(Cave-in)** 0.2'-1.8' **(SP)** Brown to reddish yellow (7.5YR) at top to light brown-gray at base; sand; fine to medium-grained; well sorted; unconsolidated; H<sub>2</sub>O saturated in lower 2/3; weak hydrocarbon odor at base.

9.0'-11.0' 1.7' sample in split spoon. 0.0'-1.7' **(SP)** Light-gray tan; sand; fine to medium-grained; grading to **(SW)**. Gray (N3); sand with trace of gravel; fine to coarse-grained; poorly sorted; H<sub>2</sub>O saturated; very weak hydrocarbon odor.

TOTAL DEPTH: 11ft bgs



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5600 WYOMING BOULEVARD, NE., SUITE 150, ALBUQUERQUE, NEW MEXICO 87113  
 PHONE: (505) 293-1156 FAX: (505) 293-1971

SITE ID: **CLIMATE ROOFING**  
 CLIENT: **BCEHD**  
 WELL ID: **B-3/FTW-13** PAGE 1 OF 1

DATE OF DRILLING: 10-25-00  
 LOGGED BY: W. Brown  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: ~8.0 ft  
 TOTAL DEPTH: 15ft  
 CASING: 0-5' 2" dia sch 40 PVC-flush threaded  
 SCREEN: 5-15' 0.01slot 2" dia sch 40 PVC  
 SURFACE COMPLETION: Standard 8x12 can w/ concrete pad

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	Sample Interval	SIMPLIFIED LITHOLOGY
Cement							Surface Conditions: Loose soil.
Bentonite Pellets (hydrated)					2		0.0'-0.5' Concrete and other fill debris. (cuttings).
					4		0.5'-1.0' (SM/SC) Dark brown; silty clayey sand; very fine-grained. (cuttings).
				0.0	6		1.0'-3.0' (SM) Tan-brown (10YR); silty sand; very fine-grained; loose; no apparent hydrocarbon odor. (cuttings).
				0.0	8		3.0'-5.0' 1.1' sample in split spoon. 0.0'-0.4' (SM/SC) Brown (10YR); silty clayey sand; very fine-grained; weak CaCO <sub>3</sub> cement; grades to 0.4'-1.0' (SC). Brown (10YR); clayey sand with silt; very fine-grained; dense to CaCO <sub>3</sub> cement; grades to 1.0'-1.1' (SM/SC). As above.
10-20 Silica Sand			MW-13 9.0' (SP) 1100	>10,000	10		5.0'-7.0' 1.9' sample in split spoon. 0.0'-0.2' (SM/SC) As above. 0.2'-1.9' Coarsening downward sequence: 0.2'-0.6' (SM) Light brown (10YR); silty sand; very fine-grained; with disseminated CaCO <sub>3</sub> cement. 0.6'-0.9' (SM/SP) Tan (10YR); sand with silt; very fine to fine-grained; unconsolidated; grades to 0.9'-1.9' (SP). Tan-brown (10YR) with thin dark brown band ~1" thick at 1.5' depth; sand; fine to medium-grained; trace coarse-grained sand and pebbles; unconsolidated.
0.01 Slot Screen			MW-13 11.0' (SP) 530/1017	28.0	2		7.0'-9.0' 1.7' sample in split spoon. 0.0'-1.1' (SP/SW) Tan-brown; sand with ~5% gravel clasts; medium to coarse-grained; grades to 1.1'-1.7' (SP) Dark gray (N3); sand; medium to coarse; unconsolidated; H <sub>2</sub> O saturated below ~8' BSG; strong hydrocarbon odor present.
			MW-13 13.0' (SP/SW) <5		4		9.0'-11.0' 1.9' sample in split spoon. 0.0'-1.9' (SP) Dark gray (N3) sand; fine to medium-grained; unconsolidated; hydrocarbon saturated with very strong hydrocarbon odor present.
					6		11.0'-13.0' 1.3' sample in split spoon. 0.0'-1.3' (SP/SW) Light brown; sand; medium to coarse-grained; H <sub>2</sub> O saturated.
					8		13.0'-15.0' Cuttings. Indicate (SP/SW) as above.
					20		

TOTAL DEPTH: 15ft bgs



**TECUMSEH PROFESSIONAL ASSOCIATES, INC.**

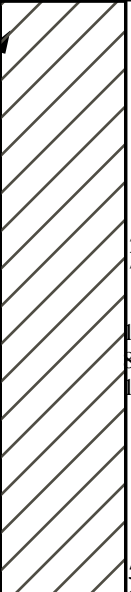
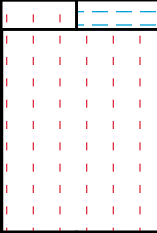
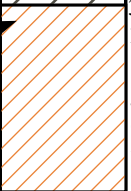
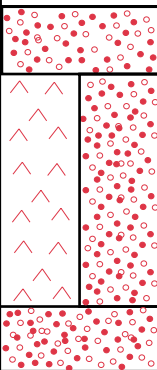

5600 WYOMING BOULEVARD, NE., SUITE 150, ALBUQUERQUE, NEW MEXICO 87113  
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SITE ID: **CLIMATE ROOFING**  
 CLIENT: **BCEHD**  
 BOREHOLE ID: **B-4** PAGE 1 OF 1

DATE OF DRILLING: 10-31-00  
 LOGGED BY: W. Brown  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: ~8.0 ft  
 TOTAL DEPTH: 13ft  
 CASING: NA  
 SCREEN: NA  
 SURFACE COMPLETION: Native Fill

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	Sample Interval	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout		11/10/29/24 70%		0.0	4		
		13/12/8/8 100%		2.0	6		
		2/4/4/6 90%		750	8		
Bentonite Pellets (hydrated)		5/4/3/5 100%	B-4 10.5' (SP/SW)	220	10		
		4/6/9/10 70%	B-4 13' (SP)	1500	2		
				1.0	4		
					6		
					8		
					20		

Surface Conditions: Dirt.

**0.0'-0.5' (SM/SC)** Dark brown; clayey silty sand; organic matter; unconsolidated; moist; no apparent hydrocarbon odor present; (cuttings).

**0.5'-3.0' (SM)** (7.5YR) Light reddish-brown; silty sand; unconsolidated; slightly moist; no apparent hydrocarbon odor present; (cuttings).

**3.0'-5.0'** 1.4' sample in split spoon. **0.0'-0.4' (SM)** As above. **0.4'-1.4' (SM/SC)** Brown (10YR); silty clayey; very fine-grained sand; dense CaCO<sub>3</sub> cemented; slightly moist; no apparent hydrocarbon odor present.

**5.0'-7.0'** 2.0' sample in split spoon. **0.0'-0.1' (Cave-in)** **0.1'-0.5' (SM/ML)** Light tan; silt-sand; very fine-grained; slightly moist; grades to **0.5'-0.8' (SM/SC)**. As above; brown (10YR); stage 2+ CaCO<sub>3</sub> cement in nodules; dense. **0.8'-2.0' (SM)** Tan-light brown (10YR); sand with minor silt; very fine to fine-grained; moist @ base; no apparent hydrocarbon odor present.

**7.0'-9.0'** 1.8' sample in split spoon. **0.0'-1.8'** Coarsening downward sequence starting with **(SP)** Tan-brown (10YR); sand; fine-grained sand grading to medium-coarse-grained sand than **(SW/SP)**; medium to coarse-grained sand with ~5% gravel and pebble clasts; lower 1/2 of sample is H<sub>2</sub>O saturated; lower 1/3 is gray-brown and has accompanying moderate to strong hydrocarbon odor.

**9.0'-11.0'** 2.0' sample in split spoon. **0.0'-1.0' (SP/SW)** Tan-brown/light gray as above; unconsolidated; H<sub>2</sub>O saturated; weak to moderate hydrocarbon odor. **1.0'-2.0' (SP/SW)** Dark gray (N3); sand; medium to coarse-grained sand with minor fine-grained sand; unconsolidated; hydrocarbon saturated-very strong odor. (Color change across core sample is gradual. No pebbles or gravels in lower foot.)

**11.0'-13.0'** 1.4' sample in split spoon. **0.0'-1.0' (SP/SW)** As above; brown (10YR); sand with ~5% gravel/pebble clasts; medium to coarse-grained. **1.0'-1.4' (SP)** Tan-brown (10YR); medium to fine-grained sand.

TOTAL DEPTH: 13ft bgs



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SITE ID: CLIMATE ROOFING  
 CLIENT: BCEHD  
 BOREHOLE ID: B-5 PAGE 1 OF 1

DATE OF DRILLING: 10-31-00  
 LOGGED BY: W. Brown  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: ~8.0 ft  
 TOTAL DEPTH: 13ft  
 CASING: NA  
 SCREEN: NA  
 SURFACE COMPLETION: Native Fill

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	Sample Interval	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout		7/13/15/26 75%		0.0	4		
		14/14/5/4 90%		2.0	6		
		5/6/6/4 100%		0.0	8		
		8/7/7/4 100%	B-5 10.5' (SP) 840	2200	10		
Bentonite Pellets (hydrated)		12/12/12/11 90%	B-5 13' (GW/SW) 65	1.0	2		
					4		
					6		
					8		
					20		

Surface Conditions: Dirt.

0.0'-1.0' (GM/SM) Brown (10YR); silty clayey sand with pea gravel; (cuttings).

1.0'-3.0' (SM) (7.5YR) Silty sand; very fine-grained; no apparent hydrocarbon odor present; (cuttings).

3.0'-5.0' 1.5' sample in split spoon. 0.0'-0.3' (GM) Gravel; (fill); cave-in. 0.3'-1.0' (SM) Reddish-yellow brown (7.5YR); silty sand; very fine-grained; unconsolidated; grades to 1.0'-1.5' (SM/SC). Light brown; silty clayey sand; very fine-grained; with disseminated CaCO<sub>3</sub> cement.

5.0'-7.0' 1.8' sample in split spoon. 0.0'-0.3' (SM) As above. 0.3'-1.1' (SM/SC) Brown (10YR); silty clayey sand; very fine-grained; dense CaCO<sub>3</sub> cemented (Stage 2+); dry; no apparent hydrocarbon odor present. 1.1'-1.8' (SM) Reddish-brown (7.5YR); silty clayey sand; very fine-grained; unconsolidated; slightly moist; no apparent hydrocarbon odor present.

7.0'-9.0' 2.0' sample in split spoon. 0.0'-0.3' Cave-in. 0.3'-0.8' (SP) Tan to light brown (10YR); sand; fine to medium-grained; unconsolidated; moist; grades to 0.8'-1.4'. (SP/SW) Tan-brown; sand with minor pebbles; fine to coarse-grained sand; unconsolidated; H<sub>2</sub>O saturated; no apparent hydrocarbon odor present. 1.4'-2.0' (SP) Light gray-tan; sand with minor pebbles; medium to coarse-grained; unconsolidated; H<sub>2</sub>O saturated; moderate to strong hydrocarbon odor present.

9.0'-11.0' 2.0' sample in split spoon. 0.0'-2.0' (SP) Medium gray (N4) and lower 2" changes to tan brown; sand; medium-grained; unconsolidated; H<sub>2</sub>O saturated; moderate hydrocarbon odor present which lessens in lower 2" substantially.

11.0'-13.0' 1.8' sample in split spoon. 0.0'-1.8' (SP/SW) Tan-brown; sand; medium to fine-grained with coarse-grained component; unconsolidated; H<sub>2</sub>O saturated; no apparent hydrocarbon odor.

TOTAL DEPTH: 13ft bgs



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SITE ID: CLIMATE ROOFING  
 CLIENT: BCEHD  
 BOREHOLE ID: B-6 PAGE 1 OF 1

DATE OF DRILLING: 11-1-00  
 LOGGED BY: W. Brown  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: ~8.0 ft  
 TOTAL DEPTH: 13ft  
 CASING: NA  
 SCREEN: NA  
 SURFACE COMPLETION: Native Fill

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	SAMPLE INTERVAL	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout		2/10/21/25 65%		0.0	4		
		11/9/8/8 100%		0.0	6		
		5/6/6/7 95%		0.0	8		
		5/7/7/4 95%	B-6 10.0' (SP) 1700/ 1618	7000 9000 350	10		
Bentonite Pellets (hydrated)		3/7/8/8 80%		4.0	2		
					4		
					6		
					8		
					20		

Surface Conditions: Loose Sediment

**0.0'-1.0' (SM/SC)** Dark Brown; silty clayey sand; very fine-grained; organic matter; some asphalt chunks; unconsolidated; moist; (cuttings).

**1.0'-3.0' (SM)** (7.5YR) Reddish-brown; silty sand with minor clay; slightly moist; (cuttings).

**3.0'-5.0' 1.3' sample in split spoon. 0.0'-0.2' (Cave-in)**

**0.2'-0.8' (SM)** Reddish-brown (7.5YR); silty sand; unconsolidated; slightly moist; no apparent hydrocarbon odor present.

**0.8'-1.3' (SM/SC)** Brown (10YR); silty clayey very fine-grained sand grading to (SC) clayey very fine-grained sand at base; dense; Stage 2+ CaCO<sub>3</sub> cement; no apparent hydrocarbon odor present.

**5.0'-7.0' 2.0' sample in split spoon. 0.0'-0.4' (SM/SC)** As above with CaCO<sub>3</sub> cement; clayey silty sand. **0.4'-1.2' (SP)** Tan-brown (10YR); fine grading to medium-grained sand at base; unconsolidated; slightly moist; grades to **1.2'-2.0' (SW)** Tan-brown (10YR); sand with ≤5% pebbles/gravel; fine to coarse-grained; unconsolidated; slightly moist; no apparent hydrocarbon odor present.

**7.0'-9.0' 1.9' sample in split spoon. 0.0'-1.9' (SP)** Tan-brown (10YR) at top grading to dark gray (N2) and black at basal 0.4' sand; medium to coarse-grained; unconsolidated; H<sub>2</sub>O saturated in lower 2/3 of core; no apparent hydrocarbon odor at top but very strong gasoline odor at base; blackened zone is hydrocarbon saturated.

**9.0'-11.0' 1.9' sample in split spoon. 0.0'-0.1' (Slough) 0.1'-1.9' (SP)** Dark gray (N2); sand; fine to medium-grained; unconsolidated; H<sub>2</sub>O saturated; hydrocarbon saturated with very strong hydrocarbon odor; sediment near base is brown-gray with lesser odor.

**11.0'-13.0' 1.6' sample in split spoon. 0.0'-1.6' (SP)** Medium to coarse-grained sand grading to (SW). Light brown color (10YR); medium to coarse-grained with ~5-10% pebbles/gravel; H<sub>2</sub>O saturated; no apparent hydrocarbon odor present.

TOTAL DEPTH: 13ft bgs



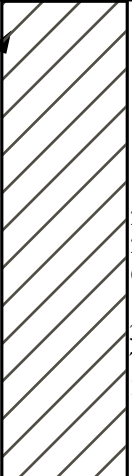
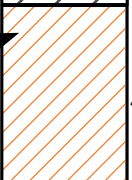
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SITE ID: CLIMATE ROOFING  
 CLIENT: BCEHD  
 BOREHOLE ID: B-7 PAGE 1 OF 1

DATE OF DRILLING: 11-1-00  
 LOGGED BY: W. Brown  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: ~8.0 ft  
 TOTAL DEPTH: 11ft  
 CASING: NA  
 SCREEN: NA  
 SURFACE COMPLETION: Native Fill

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	SAMPLE INTERVAL	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout		2/10/21/25 65%		0.0	4		0.0'-0.5' (SM/SC) Brown (10YR); clayey silty sand; organic matter; unconsolidated; moist; (cuttings).
		3/5/7/7 100%		0.0	6		0.5'-3.0' (SM) Reddish-brown (7.5YR); silty sand; very fine-grained; unconsolidated; moist; (cuttings).
Bentonite Pellets (hydrated)		2/4/4/6 85%	B-7 9.0' (SP)	0.0	8		3.0'-5.0' 1.8' sample in split spoon. 0.0'-0.3' (SM) As above. 0.3'-1.8' (SM) Fining downward sequence. 0.3'-1.0' (SC/ML) Brown (10YR); clayey sand with abundant silt; very fine-grained; grades to 1.0'-1.8'. (SC) Clayey sand; plastic; medium dense; moist; no apparent hydrocarbon odor present.
		4/6/13/12 100%		0.0	10		5.0'-7.0' 1.9' sample in split spoon. 0.0'-0.7' (ML/CL) Brown (10YR); silt-clay; medium soft; plastic; slightly moist. 0.7'-1.9' (SM) Tan-brown (10YR); silty sand; very fine-grained; grading to (SP); tan-brown (10YR); fine-grained sand at base; unconsolidated; no apparent hydrocarbon odor present.
					2		7.0'-9.0' 1.7' sample in split spoon. 0.0'-0.2' (Slough) 0.2'-0.6' (SP) Tan (10YR); medium to coarse-grained sand; unconsolidated; H2O saturated. 0.6'-1.2' (SM) Tan (10YR); silty sand; very fine to fine-grained. 1.2'-1.7' (SP) Tan (10YR); sand; medium to coarse-grained; unconsolidated; H2O saturated.
					4		9.0'-11.0' 2.0' sample in split spoon. 0.0'-1.1' (SP) As above. 1.1'-1.6' (SM) Tan-brown (10YR); silty sand; very fine-grained; unconsolidated; H2O saturated. 1.6'-2.0' (SW) Grading to (GW) at base. Medium to coarse-grained sand matrix with increasing subrounded pebble/gravel clasts with depth; clasts to 3/4"; entire core is H2O saturated.
					6		
					8		
					20		

TOTAL DEPTH: 11ft bgs



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SITE ID: **CLIMATE ROOFING**  
 CLIENT: **BCEHD**  
 WELL ID: **B-8/FTW-14** PAGE 1 OF 1

DATE OF DRILLING: 11-1-00  
 LOGGED BY: W. Brown  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: ~8.0 ft  
 TOTAL DEPTH: 15ft  
 CASING: 0-5' 2" dia sch 40 PVC-flush threaded  
 SCREEN: 5-15' 0.01slot 2" dia sch 40 PVC  
 SURFACE COMPLETION: Standard 8x12 can w/ concrete pad

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	SAMPLE INTERVAL	SIMPLIFIED LITHOLOGY
Cement							
Bentonite Pellets (hydrated)					2		
					4		
				0.0	6		
				0.0	8		
10-20 Silica Sand				1.0	10		
			B-8 9.0' (SP) 46/18	800	12		
				4,000	14		
				13.0	16		
0.01 Slot Screen				0.0	18		
					20		

Surface Conditions: Loose soil.  
 0.0'-1.0' Fill (?) (GM) Gravelly silty sand; (cuttings).  
 1.0'-3.0' (SM) Reddish-brown (7.5YR); silty sand; very fine-grained; moist; (cuttings).  
 3.0'-5.0' 1.3' sample in split spoon. 0.0'-0.3' (SM) As above. 0.3'-1.3' (SM/ML) Brown (10YR); dense; Stage (2+); CaCO<sub>3</sub> cemented; no apparent hydrocarbon odor present.  
 5.0'-7.0' 1.9' sample in split spoon. 0.0'-0.4' (SM/ML) As above with lesser cement. 0.4'-1.2' (SM) Tan-brown (10YR) and dark brown 1" thick zone at base; sand with silt; very fine-grained; unconsolidated; grades to 1.2'-2.0'. (SP) Tan-brown; sand; medium-grained; overall coarsening downward sequence; unconsolidated; very moist at base; no apparent hydrocarbon odor present.  
 7.0'-9.0' 1.7' sample in split spoon. 0.0'-0.2' (Cave-in) 0.2'-0.6' (SP) As above. 0.6'-1.3' (SW) (10YR) at top grading to (N2) dark gray at base; sand with minor pebbles; fine to coarse-grained; H<sub>2</sub>O saturated near hydrocarbon saturation; very strong hydrocarbon odor present.  
 9.0'-11.0' 2.0' sample in split spoon. 0.0'-0.7' (SP) Gray (N3); sand; very fine to fine-grained. 0.7'-1.5' (SP) Gray (N4); sand; fine to medium-grained. 1.5'-2.0' (SP/SW) Light gray brown; sand with ≤5% pebbles; fine to coarse-grained but mostly medium-grained sand; unconsolidated; H<sub>2</sub>O saturated throughout; hydrocarbon odor strong at top, lessens with depth.  
 11.0'-13.0' 1.8' sample in split spoon. 0.0'-1.8' (SP) Brown (10YR); sand; medium to fine-grained; unconsolidated; H<sub>2</sub>O saturated; weak hydrocarbon odor decreases with depth.  
 13.0'-15.0' Cuttings suggest (SP) as above.

TOTAL DEPTH: 15ft bgs



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**SITE ID:** CLIMATE ROOFING  
**CLIENT:** BCEHD  
**BOREHOLE ID:** B-9 PAGE 1 OF 1

**DATE OF DRILLING:** 11-29-00  
**LOGGED BY:** R. Sengebush  
**DRILLER:** Rodger's Drilling/H. Reichert  
**BOREHOLE DIAMETER:** 8"  
**DRILLING METHOD:** Hollow Stem Auger  
**SAMPLING METHOD:** 3" diam, 2' long Split Spoon  
**TOP OF CASING ELEV:** NA  
**DEPTH TO WATER:** 7.5 ft  
**TOTAL DEPTH:** 15ft  
**CASING:** NA  
**SCREEN:** NA  
**SURFACE COMPLETION:** Fill with Bentonite.

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	SAMPLE INTERVAL	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout					2		
					4	ND	
Bentonite Pellets (hydrated)					6	ND	
					8	344	
					10	341	
					2	338	
					4	195	
					6		
					8		
					20		

Surface Conditions: Loose Sediment  
1.0'-3.0' **(SM)** Fill; brownish-yellow (10YR6/8); silty sand; very well sorted; damp; no apparent hydrocarbon odor present.  
3.0'-5.0' 2.0' sample in split spoon. 3.0'-3.5' **(SP)** Sand; very well sorted; medium to fine-grained; damp. 3.5'-4.0' **(SM)** Silty sand; very well sorted; damp.  
5.0'-7.0' 2.0' sample in split spoon. 5.0'-7.0' **(SP)** Sand; fine to medium-grained; very well sorted; damp; no apparent hydrocarbon odor present.  
7.0'-9.0' 1.5' sample in split spoon. 7.0'-7.5' **(SP)** As above; H<sub>2</sub>O at 7.5'. 7.5'-9.0' **(SW)** Olive gray (5YR4/1) from 7.0'-8.8' and from 8.8'-9.0' is dark gray (N3); sand; medium to coarse-grained; moderate to poorly sorted; H<sub>2</sub>O saturated; strong petroleum odor present.  
9.0'-11.0' 2.0' sample in split spoon. 9.0'-11.0' **(SP)** Dark gray (N3); sand; medium-grained; well sorted; H<sub>2</sub>O saturated; strong petroleum odor present.  
11.0'-13.0' 1.0' sample in split spoon. 11.0'-12.0' **(SP/SW)** Brown (10YR5/3); sand; medium to coarse-grained; moderately sorted; H<sub>2</sub>O saturated; appears to be out of the gray petroleum stained sand with moderate odor.  
13.0'-15.0' 1.0' sample in split spoon. 13.0'-14.0' **(SP/SW)** Brown (10YR5/3); sand; medium to coarse-grained; moderately sorted; H<sub>2</sub>O saturated; moderate odor present.

TOTAL DEPTH: 15ft bgs



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SITE ID: CLIMATE ROOFING  
 CLIENT: BCEHD  
 BOREHOLE ID: B-10 PAGE 1 OF 1

DATE OF DRILLING: 11-29-00  
 LOGGED BY: R. Sengebush  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: ~8.0 ft  
 TOTAL DEPTH: 15ft  
 CASING: NA  
 SCREEN: NA  
 SURFACE COMPLETION: Fill with Bentonite.

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	Sample Interval	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout					2		
				ND	4		
Bentonite Pellets (hydrated)				ND	6		
				36.1	8		
			B-10 100- 11.0' (SW) 39	81.2	10		
				36.9	2		
				19.2	4		
					6		
					8		
					20		

Surface Conditions: Fill.

0.0'-3.0' (SM) Fill; dark gray; silty sand with pea gravel; damp; no apparent hydrocarbon odor present; (cuttings).

3.0'-5.0' 1.5' sample in split spoon. 0.0'-0.5' (SM) Yellowish-brown; silty sand; very well sorted; dary; no apparent hydrocarbon odor present. 0.5'-1.5' (ML) Tri-white spots; silt; laminated; partings 0.25" thick; dry; no apparent hydrocarbon odor present.

5.0'-7.0' 1.5' sample in split spoon. 0.0'-0.5' (ML) Brown to yellowish-brown (10YR); silt. 0.5'-1.5' (SP) (10YR); sand; fine-grained; very well sorted; damp; no apparent hydrocarbon odor present.

7.0'-9.0' 1.5' sample in split spoon. 0.0'-1.5' (SP) As above; fine to medium-grained; well sorted; no apparent hydrocarbon odor present. 0.5'-1.5' (SW) (10YR); sand; medium to coarse-grained; moderately sorted; H2O saturated; no apparent hydrocarbon odor present.

9.0'-11.0' 2.0' sample in split spoon. 0.0'-1.0' (SW) Gray; sand medium to coarse-grained; moderately sorted. 1.0'-2.0' (SW) As above; moderate petroleum odor present.

11.0'-13.0' 2.0' sample in split spoon. 11.0'-13.0' (SP/SW) As above; but not gray; no to weak hydrocarbon odor present.

13.0'-15.0' 1.0' sample in split spoon. 13.0'-14.0' (SP/SW) Brownish yellow ( $\pm$ 10YR) but color is not stained; sand; medium to coarse-grained; moderately sorted; H2O saturated; weak to moderate petroleum odor present.

TOTAL DEPTH: 15ft bgs



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SITE ID: CLIMATE ROOFING  
 CLIENT: BCEHD  
 BOREHOLE ID: B-11 PAGE 1 OF 1

DATE OF DRILLING: 11-29-00  
 LOGGED BY: R. Sengebush  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: Hollow Stem Auger  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: ~8.0 ft  
 TOTAL DEPTH: 15ft  
 CASING: NA  
 SCREEN: NA  
 SURFACE COMPLETION: Fill with Bentonite.

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	SAMPLE INTERVAL	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout					2		
					4	ND	
					6	ND	
					8	110	
					10	3589	
					2	610	
					4	783	
					6		
					8		
					20		
Bentonite Pellets (hydrated)					2		
					4		
					6		
					8		
					10		
					12		
					14		
					16		
					18		
					20		

Surface Conditions: Fill.

0.0'-3.0' (SM) Fill; yellowish-brown (10YR); silty sand with pea gravel; (cuttings).

3.0'-5.0' 2.0' sample in split spoon. 0.0'-1.0' (SM) (10YR); silty sand; very well sorted. 1.0'-2.0' (SP/SM) (10YR); silty sand/sand; fine to medium-grained; very well sorted; damp; no apparent hydrocarbon odor present.

5.0'-7.0' 1.5' sample in split spoon. 0.0'-0.5' (SM) (10YR); silty sand as above. 0.5'-1.0' (SP) Yellowish-brown (10YR); sand; fine to medium-grained; very well sorted; dry; no apparent hydrocarbon odor present.

7.0'-9.0' 1.5' sample in split spoon. 0.0'-0.5' (SP/SW) Brownish yellow (10YR); sand; medium to coarse-grained; moderately sorted; damp; no apparent hydrocarbon odor present (?). 8.0'-9.0' (SP/SW) As above; H2O saturated at 8.0'; gray (5Y4/1) at 8.9'; moderately strong petroleum odor at 9.0'.

9.0'-11.0' 1.5' sample in split spoon. 0.0'-1.5' (SP/SW) Dark gray (N5); sand; medium to coarse-grained; pebbles to 0.75" 10%; very strong petroleum odor present.

11.0'-13.0' 1.0' sample in split spoon. 0.0'-0.5' (SP/SW) As above; sand; 0.5'-0.75' gray; 0.75'-1.0' light brown; moderate to strong petroleum odor present.

13.0'-15.0' 0.5' sample in split spoon. 0.0'-0.5' (SP/SW) Sand; medium to coarse-grained gravel with 10% pebbles to 1" diameter; moderate to poorly sorted; H2O saturated; very strong petroleum odor present.

TOTAL DEPTH: 15ft bgs



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 PHONE: (505) 293-1156 FAX: (505) 293-1971



**SITE ID:** CLIMATE ROOFING  
**CLIENT:** BCEHD  
**BOREHOLE ID:** B-12 PAGE 1 OF 1

**DATE OF DRILLING:** 11-29-00  
**LOGGED BY:** R. Sengebush  
**DRILLER:** Rodger's Drilling/H. Reichert  
**BOREHOLE DIAMETER:** 8"  
**DRILLING METHOD:** Hollow Stem Auger  
**SAMPLING METHOD:** 3" diam, 2' long Split Spoon  
**TOP OF CASING ELEV:** NA  
**DEPTH TO WATER:** ~7.0 ft  
**TOTAL DEPTH:** 15ft  
**CASING:** NA  
**SCREEN:** NA  
**SURFACE COMPLETION:** Fill with Bentonite.

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	Sample Interval	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout					2		
					4	ND	
					6	ND	
					8	ND	
					10	ND	
					2	ND	
					4	ND	
					6		
					8		
					20		
Bentonite Pellets (hydrated)					2		
					4		
					6		
					8		
					10		
					12		
					14		
					16		
					18		
					20		

Surface Conditions: Fill.

**0.0'-3.0' (SP)** Fill; (10YR); sand; damp; no apparent hydrocarbon odor present. (cuttings).

**3.0'-5.0'** 2.0' sample in split spoon. 0.0'-1.0' **(SM)** (10YR); silty sand; well sorted; damp. 1.0'-2.0' **(SP)** (10YR) yellowish-brown; sand; fine-grained; very well sorted; damp; no apparent hydrocarbon odor present.

**5.0'-7.0'** 2.0' sample in split spoon. 0.0'-0.2' **(ML)** Slough?; silty sand with clay. 0.2'-2.0' **(SP/SW)** Yellowish-brown (10YR); sand to pebbly sand; medium to coarse-grained with up to 5-10% pebbles to 0.5"; moderately sorted; loose; damp to dry; loose; no apparent hydrocarbon odor present.

**7.0'-9.0'** 1.5' sample in split spoon. 0.0'-1.5' **(SW)** Yellowish-brown (10YR); sand to pebbly sand; medium to coarse-grained with 5% pebbles to 0.5"; moderately H2O saturated at ~7.0'; no apparent hydrocarbon odor present.

**9.0'-11.0'** 1.5' sample in split spoon. 0.0'-1.5' **(SP/SW)** Yellowish brown (10YR); sand; medium to coarse-grained moderately sorted; moderately sorted; H2O saturated; no apparent hydrocarbon odor present.

**11.0'-13.0'** 0.5' sample in split spoon. 0.0'-0.5' **(SP/SW)** Yellowish brown (10YR); sand; medium to coarse-grained; moderately sorted; carbonized plant material at 0.3'; pebbles to 1" diameter 25%; H2O saturated; no apparent hydrocarbon odor present.

**13.0'-15.0'** 0.5' sample in split spoon. 0.0'-0.5' **(SW/GP)** Yellowish brown (10YR); sand and gravel; moderate to poorly sorted; H2O saturated; no apparent hydrocarbon odor.

TOTAL DEPTH: 15ft bgs



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**SITE ID:** CLIMATE ROOFING  
**CLIENT:** BCEHD  
**WELL ID:** B-13/FTW-15 PAGE 1 OF 1

**DATE OF DRILLING:** 11-29-00  
**LOGGED BY:** R. Sengebusch  
**DRILLER:** Rodger's Drilling/H. Reichert  
**BOREHOLE DIAMETER:** 8"  
**DRILLING METHOD:** HSA  
**SAMPLING METHOD:** 3" diam, 2' long Split Spoon  
**TOP OF CASING ELEV:** NA  
**DEPTH TO WATER:** ~8.0 ft  
**TOTAL DEPTH:** 15ft  
**CASING:** 0-5' 2" dia sch 40 PVC-flush threaded  
**SCREEN:** 5-15' 0.01slot 2" dia sch 40 PVC  
**SURFACE COMPLETION:** Standard 8x12 can w/ concrete pad

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	Sample Interval	SIMPLIFIED LITHOLOGY
Cement					2		
Bentonite Pellets (hydrated)				ND	4		
				ND	6		
10-20 Silica Sand			B-13 8.5'-9.0' (SW) 7.3	ND	8		
				101	10		
0.01 Slot Screen				57.3	2		
					4		
				33.0	6		
					8		
					20		

Surface Conditions: Fill.  
0.0'-3.0' (SM) Yellowish-brown; silty sand; medium to fine-grained; poorly sorted; damp. (cuttings).  
3.0'-5.0' 2.0' sample in split spoon. 3.0'-4.0' (SM) Yellowish-brown (10YR); silty sand; fine-grained; well sorted; partings 0.25"; dry; no apparent hydrocarbon odor present. 4.0'-5.0' (SP) Sand; fine-grained; well sorted; loose; dry; no apparent hydrocarbon odor present.  
5.0'-7.0' 1.7' sample in split spoon. 5.3'-5.5' (SM) (slough?) as in 3.0'-4.0'. 5.5'-7.0' (SP) Yellowish-brown (10YR); sand; fine to medium-grained; very well sorted; loose; damp; no apparent hydrocarbon odor present.  
7.0'-9.0' 1.5' sample in split spoon. 7.5'-8.0' (SP) As above. 8.0'-9.0' (SW) Yellowish-brown from 8.0'-8.5' and light gray from 8.5'-9.0'; sand; medium to coarse-grained; poorly sorted; H2O saturated at 8.0'; moderate hydrocarbon odor present.  
9.0'-11.0' 1.0' sample in split spoon. 10.0'-11.0' (SW) Gray to dark gray (5Y4/1-N3); sand; medium to coarse-grained; moderately sorted; H2O saturated; moderate hydrocarbon odor present.  
11.0'-13.0' 0.5' sample in split spoon. 12.5'-13.0' (SP/SW) Yellowish-brown to light gray; sand; medium to coarse-grained pebbles to 0.5" diameter 5%; moderately sorted; moderate hydrocarbon odor present.  
13.0'-15.0' 0.5' sample in split spoon. 14.5'-15.0' (SW/GP) Yellowish-brown (10YR); sand; medium to coarse-grained with 10% pebbles to 1" diameter; poorly sorted; minimum hydrocarbon odor present.

TOTAL DEPTH: 15ft bgs



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SITE ID: **CLIMATE ROOFING**  
 CLIENT: **BCEHD**  
 BOREHOLE ID: **B-14** PAGE 1 OF 1

DATE OF DRILLING: 12-4-00  
 LOGGED BY: SCG  
 DRILLER: Rodger's Drilling/H. Reichert  
 BOREHOLE DIAMETER: 8"  
 DRILLING METHOD: HSA  
 SAMPLING METHOD: 3" diam, 2' long Split Spoon  
 TOP OF CASING ELEV: NA  
 DEPTH TO WATER: 8 ft  
 TOTAL DEPTH: 13 ft  
 CASING: NA  
 SCREEN: NA  
 SURFACE COMPLETION: NA

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	Sample Interval	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout				0.4	2		
				1.2	4		
Bentonite Pellets (hydrated)				0.5	6		
				0.9	8		
			B-14 10.0-10.5' (SW)	0.5	10		
				1.3	2		
					4		
					6		
					8		
					20		

Surface Conditions: Sandy soil, pebbles, grasses.

0.0'-3.0' (SM) 10YR; silty sand; fine-grained; some pebbles from surface; moist; no apparent hydrocarbon odor present.

3.0'-5.0' 1.75' sample in split spoon. 3.25'-4.0' (SM) 10YR; silty sand; fine to very fine-grained; loose; slightly moist; no apparent hydrocarbon odor present. 4.0'-5.0' (SM) 10YR; same as above; fine to very fine-grained; silty sand; silt content decreasing; no apparent hydrocarbon odor present.

5.0'-7.0' 1.8' sample in split spoon. 5.2'-7.0' (SM) 10YR; sand; very fine-grained; well sorted; little moisture; no apparent hydrocarbon odor present.

7.0'-9.0' 1.6' sample in split spoon. 7.4'-7.6' Same as 5.2'-7.0'. 7.6'-9.0' (SW) 10YR; medium-grained sand grading to coarse-grained; very little fine-grained; small pebbles; no apparent hydrocarbon odor present.

9.0'-11.0' 1.0' sample in split spoon. 9.0'-10.0' (SW) 10YR; coarse-grained sand; fine to coarse-grained gravel.

11.0'-13.0' 0.8' sample in split spoon. 11.0'-11.8' (SW) Same as 9.0'-11.0' above.

TOTAL DEPTH: 13ft bgs



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**SITE ID:** CLIMATE ROOFING  
**CLIENT:** BCEHD  
**BOREHOLE ID:** B-15 PAGE 1 OF 1

**DATE OF DRILLING:** 12-5-00  
**LOGGED BY:** SCG  
**DRILLER:** Rodger's Drilling/H. Reichert  
**BOREHOLE DIAMETER:** 8"  
**DRILLING METHOD:** HSA  
**SAMPLING METHOD:** 3" diam, 2' long Split Spoon  
**TOP OF CASING ELEV:** NA  
**DEPTH TO WATER:** ~8 ft  
**TOTAL DEPTH:** 13 ft  
**CASING:** NA  
**SCREEN:** NA  
**SURFACE COMPLETION:** NA

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	SAMPLE INTERVAL	SIMPLIFIED LITHOLOGY
Bentonite Cement Grout					2		
					4		
Bentonite Pellets (hydrated)				1.8			
				1.1			
					8		
				1.3			
			B-15 9.5-10.0' (SM) 5	1.4	10		
				1.1	2		
					4		
					6		
					8		
					20		

Surface Conditions: Sandy soil, grasses.

0.0'-3.0' (SM) 5YR4/6; silty sand; very fine-grained; loose; slightly moist; no apparent hydrocarbon odor present.

3.0'-5.0' 0.7' sample in split spoon. 0.3'-0.8' (SM) (10YR5/3) Silty sand; very fine-grained; dry. 0.8'-1.0' (SM) (10YR 5/3) Silty sand; very fine-grained; hard; semi-consolidated; dry; no apparent hydrocarbon odor present.

5.0'-7.0' 1.1' sample in split spoon. 0.2'-0.8' (SM) 10YR5/3; Silty sand; very fine-grained; dry; hard; semi-consolidated; weak cementation; no apparent hydrocarbon odor present.

7.0'-9.0' 1.5' sample in split spoon. 0.2'-1.5' (SM) Silty sand; fine-grained; loose; some pea-size gravel; wet; no apparent hydrocarbon odor present. 1.5'-1.7' (SM) Grading to medium-grained silty sand; loose; some pea-size gravel; wet; no apparent hydrocarbon odor present.

9.0'-11.0' 1.0' sample in split spoon. 0.0'-1.0' (SM) 5YR4/6; Same as 7.0'-9.0' (1.2' recovery).

11.0'-13.0' 1.0' sample in split spoon. 11.0'-12.0' (SM) Same as 7.0'-9.0' (1.0' recovery).

TOTAL DEPTH: 13ft bgs



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**SITE ID:** CLIMATE ROOFING  
**CLIENT:** BCEHD  
**BOREHOLE ID:** B-16/FTW-16 PAGE 1 OF 1

**DATE OF DRILLING:** 1-29-01  
**LOGGED BY:** SCG  
**DRILLER:** Nevex/S. Hanfenfeld  
**BOREHOLE DIAMETER:** 7"  
**DRILLING METHOD:** HSA  
**SAMPLING METHOD:** 2" diam, 2' long Split Spoon  
**TOP OF CASING ELEV:** NA  
**DEPTH TO WATER:** ~8.3 ft  
**TOTAL DEPTH:** 17 ft  
**CASING:** 0-5' 2" dia sch 40PVC-flush threaded  
**SCREEN:** 6-17' 0.01 slot 2" dia sch 40PVC  
**SURFACE COMPLETION:** Standard 8x12can w/ concrete pad

### USCS - LITHOLOGIC DESCRIPTION

CONSTRUCTION DATA	WELL/BOREHOLE CONSTRUCTION	Blowcounts/% recovery	Laboratory TPH Sample	PID Reading (ppmv)	DEPTH (in feet)	SAMPLE INTERVAL	SIMPLIFIED LITHOLOGY
	Bentonite Cement Grout	100%		0.9	2		
				0.5	4		
		60% 10, 12, 13		0.6	6		
		75% 7, 6, 4		0.5	8		
		80% 3, 5, 6		1583	10		
		30% 4, 5, 8	FTW-16 (SW) 420		2		
					4		
					6		
					8		
					20		

Surface Conditions: Sandy soil/road base coarse.  
0.0'-4.0' (SM) 5YR4/6; Fine-grained; loose; slight moisture; no apparent hydrocarbon odor present.  
4.0'-6.0' 1.25' sample in split spoon. 0.0'-0.7' (SC) 5YR 4/6; Clayey sand; fine-grained; soft; almost low plasticity; sharp contact; slightly moist. 0.7'-1.25' (SM) Sand; fine-grained; sorted with fines; no apparent hydrocarbon odor present.  
6.0'-8.0' 1.5' sample in split spoon. 0.0'-1.5' (SM) Sand; fine-grained; soft; no apparent hydrocarbon odor present.  
8.0'-10.0' 1.75' sample in split spoon. 0.0'-1.25' (SM) 5YR 4/6; sand; fine-grained; moist; slight hydrocarbon odor present. 1.25'-1.75' (SW) (N3/N5) Fine to coarse-grained sand; coarsening downwards; wet; strong hydrocarbon odor present.  
10.0'-12.0' .60' sample in split spoon. 0.0'-0.6' (SP/SW) 5YR 4/6; fine to coarse-grained sands grading from coarse-grained downwards to medium and fine-grained; N3/N5 grading back to 5YR 4/16; odor decreasing.

TOTAL DEPTH: 17ft bgs



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## **APPENDIX B**

### **Laboratory Analytical Reports**

## **APPENDIX C**

### **Health and Safety Plan**

## **APPENDIX D**

### **Hydrocarbon Spill Mass Estimates**



**SITE HEALTH & SAFETY PLAN FOR THE CLIMATE ROOFING SITE  
2700 ISLETA BLVD. SW, ALBUQUERQUE, NM  
DRILLING AND MONITORING WELL INSTALLATION**

**SITE DESCRIPTION**

**Site Location:** The site location is in the south valley of Albuquerque, New Mexico on Isleta Boulevard four blocks north of Rio Bravo Blvd.

**Project Objective:** Install soil borings and monitoring wells at a former gas station.

**Site Description:** The site is a former gasoline station that is presently unoccupied. No USTs presently exist at the site. No fuel dispensing is conducted.

**PROJECT PERSONNEL**

Project Team Leader:	William Brown
Scientific Advisor:	Stuart Faith
Site Safety Officer:	Tim Chavez
Public Information Officer:	Dave Strasser
Security Officer:	William Brown
Record Keeper:	Tim Chavez
Field Team Members:	Rob Sengebush and Rodgers Environmental Services Drilling Staff
State Agency Representative:	Lane Andress

All activities on-site must be cleared through the Project Team Leader.

**ON-SITE CONTROL**

William Brown is designated to coordinate access control and security on-site. The work zone perimeter will be established within a perimeter around the drill rig. No unauthorized person should be within the roped area.

## HAZARD EVALUATION

The primary chemical hazard associated with the well installation is gasoline vapors. Gasoline is a mixture of several products. The primary constituents of concern and their associated hazards are identified below. Many of the hazards identified below are significantly small in quantity but should still be recognized as potential safety issues.

<b><i>Substances Involved</i></b>	<b><i>Primary Hazards</i></b>
Benzene	Extremely Flammable, Gives off Poisonous Vapor, Danger of Cumulative Health Effects
Toluene	Highly Flammable, Harmful Vapor
Xylenes	Harmful Vapor, Harmful by Skin Absorption, Flammable
1,2 Dichloroethane (EDB)	Highly Flammable, Harmful Vapor, Irritating to Skin, Eyes and Respiratory System
1,2 Dibromoethane (EDC)	Harmful Vapor, Toxic in Skin Contact
Ethylbenzene	Highly Flammable, Harmful Vapor, Irritating to Skin, Eyes and Respiratory System
Methyl Tert Butyl Ether (MTBE)	Extremely Flammable, Harmful Vapor, Irritating to Skin, Eyes and Respiratory System
Naphthalene	Moderately Flammable, Skin and Eye Irritant, Gastrointestinal Irritation

Hazardous Substance Information forms for these compounds are kept on file at the FEI office. They are available for review upon request.

Because of the chemical hazards associated with the gasoline vapors, no smoking or consumption of food and beverages will be permitted. The buddy system will be mandatory for personnel in the Work Zone at all times. If organic vapor levels exceed 300 ppm, respiratory protection will be required. Workers are cautioned to minimize skin contact routes of exposure.

Explosive vapors levels will be monitored as needed to insure worker safety. No open flames or ignition sources will be operated when explosivity levels exceed 1.5% in the Work Zone. No activities will take place in the Work Zone when explosive vapor levels exceed 15%.

The project scientist or safety officer will monitor all workers on the site for signs of heat stress and will ensure that adequate drinking water is available on-site. Workers that show signs of heat stress will immediately stop work, be placed in an air-conditioned vehicle and begin taking fluids. The worker's condition will be evaluated and evacuated for medical care as needed.

## DRILLING EQUIPMENT HAZARD

The other site hazard is from mechanical drilling equipment. All non-essential personnel will keep a minimum distance of 50 feet away from the drilling equipment at all times. Hard-hats will be worn at all times when within the 50 foot radius. Steel toe boots and Level D protection are required during all drilling operations. New leather gloves will be worn when cutting core samples or handling exposed metal core ends. Safety glasses will be worn at all times during drilling, coring, or core cutting and extruding.

## PERSONAL PROTECTIVE EQUIPMENT

Based on evaluation of the potential hazards, a Level D personal protection will be designated for the work zone.

*Recommended equipment includes:*

Coveralls / Long Sleeves and long pants (minimal skin exposure)  
Safety boots/shoes

*Optional equipment includes:*

Hearing protection  
Respiratory protection (half/full face respirators with solvent cartridges)

## ENVIRONMENTAL MONITORING

The following environmental monitoring instruments shall be used on-site:

Combustible Gas Indicator to monitor flammable/explosive gas levels.

FID to monitor volatile organic vapor levels.

If monitoring indicates TLV levels exceed weighted averages, respiratory protection will be required in the affected areas.

## EMERGENCY MEDICAL CARE

A person certified in first aid and CPR will be on-site during all work activities.

First aid equipment will be available on-site. A first aid kit will be in the FEI field vehicle.

Emergency telephone numbers:

**Ambulance 911**

**Fire Dept. 911**

**Sheriff 911**

**Presbyterian Hospital Urgent Care Unit 462-7777**

**Hospital: Presbyterian Urgent Care Unit, 3436 Isleta Blvd.; Directions – south on Isleta Blvd. approximately 1/2 mile to Rio Bravo. Located on the northeast corner of Isleta and Rio Bravo. (See attached map) The Urgent Care Unit emergency entrance will be in front. Follow signs to emergency entrance. ALTERNATIVE: Call 911 for ambulance transport.**

## STANDARD TREATMENTS FOR CHEMICAL EXPOSURES ARE:

### *Splashes of the skin*

1. Flood the splashed surface thoroughly with large quantities of running water for ten (10) minutes.
2. If the situation warrants it, arrange for transport to hospital. Provide information to hospital personnel about the chemical responsible and first aid treatment administered.

### *Splashes of the eye*

1. Flood the eye thoroughly with large quantities of gently running water from tap or eye wash for ten (10) minutes.
2. Ensure the water bathes the eyeball by gently pressing open the eyelids and keeping them apart until treatment is completed.
3. Arrange transport to hospital and provide information to accompany casualty on the chemical responsible and first aid treatment administered.

#### *Inhalation of gases*

1. Ensure personal safety. Immediately remove the casualty out of danger area into fresh air.
2. If the casualty is unconscious, check breathing. If breathing has stopped, apply artificial respiration.
3. Arrange transport to hospital and provide information on compounds responsible and first aid treatment given.

#### *Ingestion of poisonous chemicals*

1. If the chemical has been confined to the mouth, give large quantities of water as a wash. Ensure mouth wash is not swallowed.
2. If the chemical has been swallowed, give copious drinks of water to dilute it in the stomach.
3. Do not induce vomiting.
4. Arrange for transport to the hospital. Provide information to accompany casualty on chemical swallowed and details of treatment given and possible estimate of the quantity and concentration of the chemical consumed.

### **EMERGENCY PROCEDURES (WILL BE MODIFIED AS REQUIRED FOR INCIDENT)**

The following standard emergency procedures will be used by on-site personnel. The Site Safety Officer shall be notified of any on-site emergencies and be responsible for ensuring that the appropriate procedures are followed.

*Personal Injury in the Work Zone:* Upon notification of an injury in the Work Zone, the designated emergency signal is a shout. All site personnel will move to the south side of Highway 66. The Site Safety Officer will evaluate the nature of the injury and select individuals to assist in moving the injured person to a safe area if possible. The appropriate first aid will be initiated by the Site Safety Officer. A designated individual will contact the ambulance service and hospital (if required). No persons will reenter the Work Zone until the cause of the injury or symptoms has been determined.

*Fire / Explosion:* Upon notification of fire or explosion on-site, the designated emergency signal is a shout. All site personnel will rapidly evacuate the site at a safe distance from the involved area. The fire department will be alerted and all personnel will remain at a safe distance until the situation is resolved.

*Personal Protective Equipment Failure:* If any site worker experiences a failure or alteration of protective equipment that affects the protection factor, that person will immediately leave the Work Zone. Reentry will not be permitted until the equipment has been repaired or replaced.

*Other Equipment Failure:* If any other equipment on-site fails to operate properly, the Project Team Leader and the Site Safety Officer will be notified and then determine the effect of this failure on continuing operations on-site. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel will leave the Work Zone until the situation is evaluated and appropriate actions taken.

The following emergency escape route is designated: south across Highway 66 to the nearest pay telephone. In all situations, when an on-site emergency results in evacuation of the Work Zone, personnel will not reenter until:

1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed.
4. Site Personnel have been briefed on any changes in the Site Safety Plan.

All site personnel have read the above plan and are familiar with its provisions.

	Name	Signature
Site Safety Officer:	<hr/>	<hr/>
Project Team Leader:	<hr/>	<hr/>
Other Site Personnel:	<hr/>	<hr/>
	<hr/>	<hr/>
	<hr/>	<hr/>
	<hr/>	<hr/>
	<hr/>	<hr/>
	<hr/>	<hr/>

**HEALTH AND SAFETY PLAN  
CLIMATE ROOFING  
Map of Route to Emergency Care**



Climate Roofing  
2700 Isleta SW

Presbyterian  
Urgent Care Unit  
3436 Isleta SW

SOIL RESIDUAL  
HYDROCARBON  
ESTIMATES  
MAP

Climate Roofing Site  
2700 Isleta Blvd, SW  
Albuquerque, New Mexico

FEI

Faith Engineering, Inc.  
1000 Lomas Boulevard NW  
Albuquerque, New Mexico 87102-1945  
(505) 243-5494 • FAX (505) 243-5585  
e-mail • faithinc@flash.net

TECUMSEH

Professional Associates, Inc.  
5600 Wyoming Blvd. NE, Suite 150  
Albuquerque, New Mexico 87109  
ph: (505) 293-1156 fax: (505) 293-1971

Map Drawn by: WJB	Client: BCEHD
Base Drafted by: WJB	Project: 99-00-1187
Date : MARCH 2001	Figure A

LEGEND

- Newly Installed Soil Boring
- Newly Installed Monitor Well
- Existing Monitor Well Location
- Maximum Soil Total Petroleum Hydrocarbons (TPH) Concentration (In parts per million (ppm))
- Diesel-Kerosene Range TPH
- Gasoline Range TPH
- Soil Headspace Isocontour (In parts per million/volume (ppm/v))
- TPH Isocontour (in ppm)

0 40 ft  
Scale

